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THE LEARNING OF DELINQUENT ADOLESCENT GIRLS AS SHOWN BY A SUBSTITUTION TEST.

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This investigation is the first of a series of mental tests to be conducted by the writer at Sleighton Farm, which is the girls' division of the Pennsylvania Reformatory School.[1] The tests were completed by thirty-seven white girls and thirty negro girls, ranging between the ages of thirteen and twenty-one years. Fourteen other negro girls were too feeble mentally to perform the tests after the initial instructions, although they worked assiduously for the period of three weeks, and three white girls failed to do 50 per cent. of the work correctly. All of the girls have been committed by the courts of the State for offences such as incorrigibility, delinquency, immorality, dependency, malicious mischief, manslaughter, lewdness, fornication, vicious conduct and vagrancy. The white girls are segregated from the negroes; each of these two groups is again divided into smaller groups who live in cottages, ranked according to an honor system in the case of the white girls.

Each individual has been given a careful physical examination by Dr. Alice Weld Tallant, whose records show that only 57 per cent. of the girls in the institution (401) are below standard height as compared with Bowditch's records. About 50 per cent. are below weight. Eye defects and hypertrophied tonsils are numerous, and between 20 and 25 per cent. of the

[1]The writer is indebted to the Superintendent, Mrs. Martha P. Falconer, for her hearty co-operation.

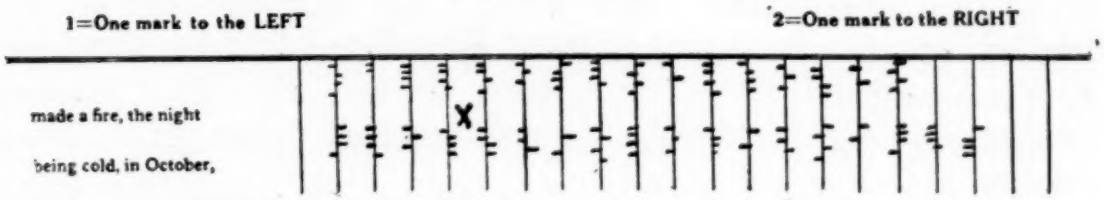
girls have venereal diseases. In regard to the teeth the dentist's records show that about one-half have poor teeth, and in about one-fifth of the cases the teeth are distinctly bad. All girls, except a few of the most deficient mentally, and those who have been demoted for misbehavior, are required to attend school for at least three and a half hours daily, except Saturday and Sunday. They are taught by college graduates from Wellesley, Smith, Vassar, Swarthmore and Wisconsin. During the school period the following test was given between 2:45 and 4:30 o'clock P. M. to five classes of girls (who had not been in school during the morning) for sixteen consecutive days, with the exception of one Saturday and two Sundays, making in all sixteen practice periods of five minutes each.

The aim of this test was to get an insight into the learning capacity of the average delinquent girl, and to note periods of acceleration and retardation in the progress of learning during the practice interim. The work, which is of such a nature that it can be carried on with little suspicion on the part of the subjects, is similar to the experiments in learning by Bair, Book, Bryan and Harter, Dearborn, Ruger, Starch, and Swift. It consists in the transliteration of a portion of Benjamin Franklin's Autobiography into a modified form of a wig-wag code used by some Texan soldiers in the Civil War.[1] The letters of the alphabet are distributed in the form of the universal typewriter keyboard, with the code equivalents attached, at the top of each of five pages. The text to be translated is placed in a narrow vertical column consisting of from seventeen to twenty letters per line at the left of each sheet under the keyboard. The remainder of the page consists of twenty vertical red lines, on which the symbols corresponding to the letters are to be placed. The code consists of different combinations of the numbers 1 and 2. The number 1 signifies that a short horizontal line is to be placed in the space to the left of the vertical red line, and the number 2 signifies that a

[1]The code was first called to the writer's attention by Mr. C. T. Gray of the University of Texas. In order to standardize the material for this test, some of the symbols were changed, a new keyboard was arranged, new reading matter added and carefully selected type was used.

similar mark is to be made at the right of the vertical red line. There are never less than two numbers nor more than four numbers to represent one letter. For example A=11, or two short marks, one below the other, to the left of the vertical red line; B=2221, or three short marks, one below the other, to the right and another below these to the left. The other letters consist of similar combinations of the numbers 1 and 2.

Q=212 W=221 E=1112 R=2111 T=2121 Y=2211 U=2122 I=121 O=21 P=211
A=11 S=2112 D=1111 F=1121 G=1122 H=12 J=122 K=1211 L=1212
Z=22 X=222 C=112 V=2212 B=2221 N=1222 M=1221



The instructions to the subjects were carefully given before the work started; an illustration of the method of writing the first two words was worked out with the classes and written on the blackboard. No information was given in regard to the errors after the first two trials, except to the apparently feeble-minded girls who were satisfied to repeat meaningless marks. Attention was frequently called to the desirability of speed and accuracy in the work.

Nothing was said at the beginning of the test in regard to practice between periods, since the work was carefully explained to all teachers, and the subjects are not permitted either paper or pencil, except during one or two school periods a day, under very strict supervision. Each girl has a separate room in the cottage, and there is little or no opportunity to discuss matters in groups outside of the schoolroom. The subjects did the work with earnestness and interest, and each was proud of her achievement at the end of a day's practice.

White Girls.

The "Senior" white girls became intensely interested in the tests, and according to the results obtained, they are a superior group. These girls showed signs of sustained attention by putting their heads down over the paper at the start,

and not raising their eyes beyond the code at the top of the paper until the five minutes had elapsed. A ten-minute period would probably not have been too long for them. The range of individual differences in ability to carry on the transliteration was very noticeable. The smallest number of substitutions accomplished on the first day by the white girls included in this report was eight letters; the largest was forty-four letters by a girl (No. 13) who knew the typewriter keyboard, and who remained in advance of all others in the school until the eleventh trial, when she was removed to her home. At the sixteenth trial eight white girls were doing one hundred and forty or more substitutions during the five-minute practice period, and the best girl (No. 3) completed two hundred and fourteen substitutions, or letters, during the last practice period. As a rule, the neatest and most accurate girls accomplished the most substitutions.

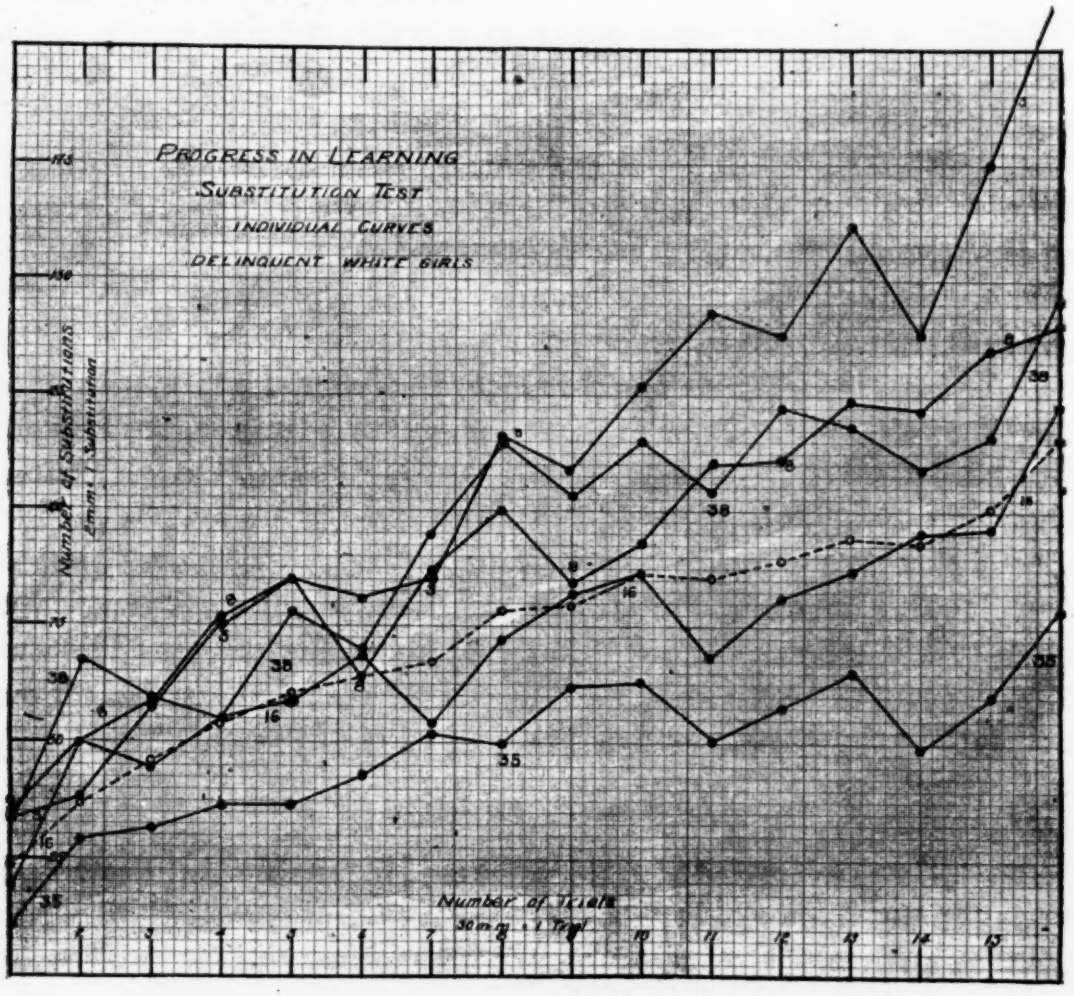


CHART I.—Progress in Learning. Delinquent White Girls.

It will be noted that no individual progresses uniformly, but each gains by irregular increments, with an occasional actual loss. There is always a gain between the first and second trial, and at the last trial. The first plateau (?) period occurs between the fifth and seventh trials, the second between the eighth and eleventh trials. These periods seem to be due to changes in method of work, and to the lack of the enthusiasm and interest manifested at the first trials. It was very evident that after the first five or six trials the interest of the better students began to wane; for the weaker students the wane came earlier than this, and there were no marked periods of later acceleration. Frequently the weaker girls continued to improve during the retarded period of the better subjects, and the practice alone was sufficient to insure slight improvement each day, until they fell into a set pace which either continued or tended to decrease in speed. The better subjects apparently would arouse sufficient energy or interest to increase for one trial during the retarded period, and then have a period of retrogression on alternate days.

The average age of the "Seniors" is 18.7 years, and the practice curve for the group (which is not included among these charts) shows a steady increase in absolute increment of gain until the sixth trial, with an irregular period of acceleration and retrogression until the eleventh trial, after which there is a steady accentuation until the end.

The twenty-two "Newly Committed White Girls" are slightly younger than the Seniors. The group curve (which is not included among these charts) shows a steady gain until the thirteenth trial, after which there is a decided drop until the fifteenth period, which is followed by a marked increase. The average curve never reaches the height of that of the other group, but the individual curves of the better subjects take the direction of the curve of the Senior group, i. e., a marked increase, a plateau period (?), another period of increase. There are a large number of subjects in this latter group who reached their maximum about the eleventh trial, and then dropped back or remained on a level; for example, No. 35 in Chart I is typical. Individual curves of this type tend to eliminate the asymmetries of the normal group curve for the better students.

The group curve for all white subjects, as shown in Chart I, shows a steady increase in improvement until the eighth day, after which the absolute increment of gain remains almost uniform until the fourteenth day, when an acceleration is evident. The time is probably too short to speak of a plateau stage.

The introspective notes given at the end of the practice periods throw light on the subsequent stages of progress or loss in the practice curves. The two difficulties most frequently mentioned at the beginning are the distinction between right and left and the location of the desired letters in the keyboard. With some individuals the second difficulty remains, although in general it was the first thing learned after a technique of making marks was acquired. The subjects state:

"We know where to look for certain letters without looking all over the paper." Others say: "Occasionally one letter gets lost in the keyboard and causes much delay." Another writes: "Sometimes when I cannot find a letter in the keyboard instantly I go on, and then put the letter down when I happen to see it."

One subject naively states: "I am doing better because the pupil of my eye has now gotten a sketch of where the letters are."

Familiarity in the location of the letters resulted in increased speed.

An accurate knowledge of the numerical equivalents for the letters was one of the last acquisitions, and the subjects almost invariably looked up the letters, since, as they state it, this required less time than to think them out. At the last trials a few individuals ignored the keyboard entirely, and stated that they knew all of the symbols; a few others said they knew all with the exception of those for Z X Y U Q J K, which appeared infrequently. The notes indicate that the first letters to be written without the aid of the keyboard were those that appeared two or three times within the same word or adjacent words.

Another change of procedure which occurred was in the method of reading the printed matter. At first all read by

letters, and the more careful subjects placed one finger of the left hand on the letters as read. It was soon noted that the better subjects were reading two or three letters, or a word, or a phrase, at one time. At the close a few claimed that they were reading by sentences when these were not too long. For example, one girl writes:

"I can do more because I remember the whole word, and I do not have to look at my words any more. I remember the word, and just keep my eyes on the keyboard and make my pencil go."

Another states: "I now remember words, phrases and sometimes short sentences."

The transition from letters to words or phrases is frequently accompanied by more errors, but these tend to disappear as rapidly as the new mode of procedure becomes more fixed.

Another increase in efficiency was found in the method of making the marks. After having grasped the fact that each subsequent mark in each letter must be slightly below the previous one, the subject began to make these lines more quickly and more uniformly. The more dexterous subjects frequently make all marks from left to right; that is, toward the red vertical lines for the left-hand mark, and away from the red lines for the right-hand marks. All reagents admitted it was impossible to increase the speed of making marks to that of reading and mentally transforming the letters.

The lowest individual average for all trials of the "Senior" group was 26.5, the highest 111.2; the former was by a slow, nervous, inaccurate, incorrigible Pennsylvania Dutch girl with slight eye defects, who was fourteen and a half years of age; the latter (No. 3, Chart I, Table I), was a short Pennsylvania Dutch girl with good eyes, good health, a baseball champion, and holder of the school record for the 100-yard dash. She is fifteen and a half years of age, and was committed, like two sisters, because she was unmanageable. This girl was the first individual to complete the five full pages of reading matter.

The five individual learning curves in Chart I show the range of individual differences, and the daily variations in the progress in learning for the sixteen days. Two millimeters on the ordinates, or vertical, equal one substitution, and fifteen on the abscissa, or horizontal, equals one trial of

TABLE I.—WHITE GIRLS.

Number of Substitutions, 40,628.
Number of Errors, 1264.
Number of Trials, 562.

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Average.
1. Subs.	8	18	28	47	46	55	83	86	93	93	86	107	96	123	87	..	70.4
Errors.	4	..	1	16	13	3	..	1	2	4	6	5	3	..	1	..	4.
2.....	29	46	53	68	82	90	87	108	97	102	112	130	95	108	128	145	90.
	4	..	2	1	2	3	..	4	2	1	2	2	..	..	..	..	1.4
3.....	33	38	57	75	85	81	85	116	109	132	143	138	162	136	175	214	111.2
	4	2	..	1	2	3	2	2	4	8	1	2	3	7	7	9	3.6
4.....	24	29	59	72	66	80	75	82	86	99	83	84	104	97	105	125	79.4
	..	1	3	3	..	4	16	8	6	9	2	8	4	3	2	3	4.5
5.....	32	59	64	92	81	107	92	107	97	119	118	139	119	119	142	144	101.9
	4	6	7	11	5	11	11	2	..	2	..	1	9	5	2	..	4.8
6.....	27	48	69	75	79	95	92	106	98	111	102	93	113	102	126	..	89.1
	1	1	1	2	..	1	..	1	4	1	3	..	..	..	2	..	1.1
7.....	10	25	49	44	46	55	66	68	73	87	85	81	90	93	97	107	67.3
	..	3	4	10	1	..	2	1	..	..	..	1	..	5	2	7	2.3
8.....	35	50	58	77	85	69	87	100	84	93	110	111	124	122	135	141	92.2
	..	..	..	..	..	3	1	4	1	..	..	1	4	2	..	1	1.0
9.....	31	50	81	83	91	81	88	95	89	93	79	93	..	..	..	..	79.5
	3	..	..	..	..	..	1	1	2	2	..	2	..	..	..	..	.91
10.....	34	51	49	70	72	82	65	73	86	99	97	81	85	89	..	..	73.1
	1	..	..	1	4	..	5	2	..	..	..	..	1	..	..	..	1.0
11.....	9	23	39	47	62	63	55	71	78	102	89	90	73	97	122	126	71.6
	..	..	..	..	..	..	1	..	2	1	4	4	2	1	2	2	1.3
12.....	26	28	19	29	41	47	51	58	65	72	73	78	70	60	64	83	54.0
	4	..	3	..	1	..	..	..	..	1	..	..	1	..	..	..	.69
13.....	44	65	70	71	92	103	84	109	109	139	134	..	..	..	..	..	92.7
	1	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	.27
14.....	13	27	54	70	72	86	71	103	98	117	102	106	138	135	135	140	91.0
	8	..	1	2	4	4	1	..	..	4	5	8	1	..	4	1	2.7
15.....	13	49	61	66	85	90	85	116	103	..	..	..	..	..	..	..	74.2
	..	..	3	6	..	..	..	..	1	..	..	..	..	..	..	..	1.1
16.....	18	50	44	55	59	69	53	72	82	87	68	81	87	95	96	123	71.1
	12	18	5	1	1	3	..	2	4	..	1	3	2	4	14	1	4.4
17.....	24	44	59	75	79	93	97	111	104	98	99	110	126	123	133	143	94.8
	2	..	1	..	3	..	..	..	..	1	1	..	..	2	..	..	.62
18.....	10	12	20	41	43	57	68	57	59	70	65	59	73	..	..	..	48.7
	2	..	2	..	..	2	4	2	2	6	9	10	23	..	..	..	4.7
19.....	28	57	39	48	54	72	83	91	91	62	123	107	103	127	..	..	77.5
	..	1	..	..	2	..	4	1	..	..	2	..	..	1	..	..	.8
20.....	18	40	31	30	45	49	47	66	70	84	83	84	90	66	72	91	76.8
	9	7	9	3	4	..	..	11	..	1	10	4	..	2	1	4	4.1
21.....	12	20	39	35	38	51	56	42	52	60	42	62	75	74	73	..	48.7
	1	4	4	..	..	1	..	1	1	..	..	3	1	1	..	..	1.1
22.....	37	72	47	51	41	53	63	87	104	94	86	106	105	105	100	114	79.0
	..	..	1	1	1	..	..	..	3	..	..	..	1	..	..	..	.43
23.....	19	36	44	47	55	54	64	77	63	93	71	95	115	113	109	95	71.2
	..	1	3	2	2	3	1	..	..	1	3	1	..	..	..	1	1.1
24.....	19	36	34	42	58	61	67	68	84	94	94	102	113	104	109	144	78.0
	9	12	3	2	1	1	..	..	..	..	..	3	1	..	8	..	2,5
25.....	38	57	56	66	80	78	100	104	100	103	109	123	116	104	86	111	89.4
	..	..	..	3	..	..	..	..	..	3	..	1	1	2	3	..	.81
26.....	33	67	59	55	78	70	90	115	109	115	104	122	118	109	116	146	94.2
	2	2	7	..	..	7	..	1	1	..	..	20	..	3	8	8	3.7
27.....	40	54	38	52	45	36	51	53	56	61	54	69	59	51	53	63	52.0
	20	6	..	4	..	1	1	..	..	1	..	..	2	..	..	..	2.8
28.....	10	26	21	24	32	30	27	26	34	26	34	28	..	..	..	..	26.5
	3	1	1	..	4	..	..	..	..	..	1	8	..	..	..	..	1.1
29.....	26	30	61	33	51	58	44	54	65	58	82	79	74	83	76	94	60.5
	..	..	3	3	1	..	19	1	..	..	..	1	..	3	..	2	2.
30.....	17	36	39	40	64	43	41	64	63	72	81	88	80	78	71	99	61.0
	..	5	1	2	1	7	..	..	..	1	..	1	3	2	7	1	2.
31.....	19	56	56	50	60	44	57	79	70	82	87	60	73	99	61	88	63.1
	..	1	..	..	1	3	1	..	1	..	2	1	2	1	2	..	1.
32.....	40	70	58	64	72	60	73	54	93	97	94	103	111	105	131	136	85.0
	..	..	3	..	4	1	2	..	11	8	8	9	15	4	3	7	4.7
33.....	19	38	24	34	44	35	33	41	46	48	44	50	52	53	55	57	42.0
	16	2	2	4	10	7	10	..	8	6	1	17	10	4	..	19	7.3
34.....	19	45	37	45	39	51	46	54	52	62	68	67	65	59	64	63	52.3
	10	2	2	3	8	1	6	1	..	..	..	3	..	1	1	1	2.4
35.....	11	30	31	37	37	43	52	50	52	63	51	58	66	49	60	79	48.0
	4	3	2	..	..	..	..	2	2	..	2	9	1	3	3	9	2.5
36.....	19	44	44	48	55	52	58	66	66	58	64	75	50	52	70	90	56.9
	..	..	..	7	..	5	..	..	..	..	2	..	1	..	..	7	1.3
37.....	37	49	38	48	68	59	73	64	64	83	77	74	86	71	53	75	63.7
	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.06
Av...	23.8	42.6	46.7	54.2	61.7	64.9	67.8	78.3	79.6	86.9	85.9	89.5	94.1	93.7	100.1	116.5	72.3

(Final average for 37 white girls, 72.3)
(Final average for all errors, 2.3.)

Age.	Nationality.	School Grade.	Eye Defects.	Ear Defects.	Tonsils and Adenoids.	Health.	Cause of Commitment.
18½	Amer.	10	..	..	Sl.	Good.	Incorrigibility—immorality.
18½	Amer.	10	Sl.	..	..	Fair.	Incorrigibility.
15½	Pa. D.	10	..	..	..	Good.	Unmanageable.
18½	Amer.	10	..	..	..	Fair—Hysterical.	Incorrigibility.
19	Pa. D.	10	Sl.	..	Sl.	Good	Vicious conduct.
18	Amer.	10	..	..	..	Good.	Incorrigibility.
17½	Amer.	10	Sl.	..	Sl.	Good.	Incorrigibility.
18½	Amer.	10	..	..	..	Good.	Vicious conduct.
18	Amer.	10	Sl.	..	..	Good.	Incorrigibility.
18½	Amer.	10	+	+	Sl.	Good.	Incorrigibility.
15	Jew.	10	..	..	+	Fair.	Incorrigibility.
17½	Fr.-Eng.	6	+	+	..	Good.	Incorrigibility.
17½	Ger.-Am.	10	..	..	Sl.	Fair.	Uncontrollable and immoral.
15½	Jew.	10	..	..	Sl.	Good.	Incorrigibility.
21	Ger.	10	..	Sl.	..	Good—(Goitre).	Incorrigibility.
17½	Amer.	10	..	..	..	Fair.	Incorrigibility and delinquent.
19½	Amer.	10	..	..	..	Good.	Incorrigibility.
19	Jew.	10	Sl.	..	..	Fair—Nervous.	Incorrigibility.
15½	Irish.	5	..	..	..	Good.	Incorrigibility.
14½	Irish.	5	..	..	Sl.	Good.	Delinquency and immorality.
15	Amer.	6	Sl.	..	..	Good.	Incorrigibility.
15½	Jew.	7	..	..	Sl.	Good.	Conspiracy.
18	Amer.	7	..	..	Sl.	Fair.	Incorrigibility and immorality.
17	Eng.	6	Sl.	Sl.	..	Good.	Incorrigibility.
17½	Ger.	5	Sl.	..	..	Fair.	Immorality.
17	Jew.	4	Sl.	..	..	Fair.	Incorrigibility.
16½	Ger.-Am.	5	..	..	..	Fair.	Incorrigibility.
14½	Pa. D.	..	+	..	..	Under size.	Incorrigibility.
15½	Scotch.	5	Sl.	..	Sl.	Good.	Delinquency.
17½	Pa. D.	6	..	..	Sl.	Under weight.	Unmanageable.
15	Amer.	..	..	..	..	Fair.	Incorrigibility.
15½	Irish.	5	Sl.	..	+	Fair.	Incorrigibility.
19	Irish.	4	Sl.	..	..	Under size.	Delinquency and incorrigibility.
14½	Irish.	5	Sl.	..	..	Good.	Incorrigibility.
15	Unk.	5	Sl.	..	..	Fair—Heart disease.	Immorality.
17½	Pa. D.	5	..	Sl.	Sl.	Good.	Received goods under false pretense.
16	Amer.	5	..	Sl.	Sl.	Good.	Fornication.

Av. age, 16.7. Sl.=Slight. +=Marked defects.

five minutes each. The number of the curve corresponds to the number of the individual in each table. No. 8 is an American girl eighteen and a half years of age, with no sense defects and good health. She was committed for vicious conduct. She is very attractive in appearance, full of fun, very capable, but negligent, and fairly untrustworthy, always carefully explaining that she will do better next time. No. 26 (38) is a tall, capable Jewess seventeen years of age, in the fourth grade. She is in fair health, and was committed for incorrigibility. No. 16 is an incorrigible and delinquent American girl of seventeen and one-half years of age, of mediocre ability, in the tenth grade, with good health, and is apparently trying to do her best to do right. No. 35 is fifteen years of age, of unknown parentage, in the fifth grade, with slight eye defect, heart disease, and was committed for immorality. Her curve shows the trend of weaker subjects in general.

The errors consisted principally in the omission or duplication of letters in words, the omission of syllables, or in a few instances the omission of words; in the wrong spelling of words; in the making of wrong symbols; and in the repeating of wrong marks. The less apt girls had difficulty in disassociating 2 from two marks and using it to signify one mark to the right. The thirty-seven girls completing the tests made in all 1264 errors, or an individual average of 2.3. The errors vary from day to day, and tend to persist throughout the series. The eight girls who had an individual average of over 90 substitutions made, respectively, on the average the following number of wrong substitutions: 1.4, 3.6, 4.8, 1.0, .27, 2.7, .62, 3.7.

Aside from the difficulties stated, there are definite situations and conditions which mitigated against progress. Foremost is inattention to the work at hand, and attention to something else. Sometimes the subjects were thinking of a lesson or review which was to follow. One subject who was constantly irritated, and who did not finish the work, wrote:

"Cannot concentrate my mind on the work at hand. Have been thinking of conditions at home. Recd. a letter from

home, the first in nearly a year and the contents is on my mind. Everything distracts me. I begin with a word, my mind wanders off, and I get all mixed up."

Later this subject writes:

"Have gotten into serious trouble which preys on my mind. Do not feel well."

Losses are usually explained by such expressions as:

"Not feeling good," "Sore eyes," "Sore hands," "Hands cold," "Headache," "Tired," "Nervous," "Excited about something else," "Interruption."

The notes show that some of the better subjects focused their attention on helpful variations, but as a rule these were permitted to survive or disappear by chance.

Negro Girls.

The negro girls are much slower to warm up to the occasion, and the first to drop back and lose interest. They are more difficult to enthuse, and cannot be forced or easily stimulated, except temporarily through flattery. Their work is more irregular; some days they will do unusually well, but drop back to the old pace with no explanation, except to say that they are not feeling so well. Their work is more largely controlled by moods. They are suspicious as to the value of the task, and they seem to carry this work along, like their other school work, with vacillating attention. They are partially occupied with the task at hand and partially with a random activity, which consists in mumbling, grumbling, humming or saying original or funny things. This second attitude seems to be a common trait with the race unless consciously inhibited.

The work of these girls is less in amount, less neat and less accurate. The marks are more irregular, and many pay little attention to errors. They frequently skip letters, get into the habit of making an H and an O just alike, and have periods of disregarding the sequence of marks. If an error is made, it is very likely to be carried regularly throughout the whole series. A few of the weaker girls, as stated above, make all the symbols wrong and fall into rhythmic movements, which are repeated regularly throughout the entire series, and seem to be entirely satisfactory to the subjects who are making

TABLE II.—NEGRO GIRLS.

Number of Substitutions, 25,338.
Number of Errors, 1935.
Number of Trials, 454.

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Average.
1. Subs.	18	17	29	34	56	50	24	41	41	76	69	43	67	51	74	86	48.5
Errors.	1	..	2	4	..	..	2	..	..	1	..	1	2	1	1	..	.94
2.....	12	10	21	25	27	31	26	23	46	39	77	65	47	41	..	..	35.0
	..	5	16	3	2	4	..	2	12	3	24	9	3	4	..	..	6.2
3.....	15	28	25	37	54	61	71	85	87	100	131	134	103	115	125	122	80.8
	4	2	1	1	..	3	3	3	1	..	1	2	..	5	2	..	1.7
4.....	8	33	25	28	53	56	57	76	55	97	..	..	..	..	..	..	48.8
	..	7	5	..	2	3	1	6	4	..	..	..	..	..	..	..	2.8
5.....	24	53	55	59	77	85	88	88	91	80	113	111	135	128	117	150	90.9
	..	..	2	..	1	..	2	1	1	1	..	1	4	..	2	1	1.
6.....	19	33	37	44	51	77	75	86	81	73	88	87	88	100	88	93	70.0
	..	..	..	1	..	1	..	3	1	..	2	..	3	..	6	1	1.1
7.....	11	30	29	23	43	54	69	58	54	57	76	49	38	69	71	84	50.9
	2	..	..	..	..	2	4	1	..	..	3	..	2	3	2	1	1.3
8.....	8	14	16	21	43	52	46	45	51	50	71	85	75	88	89	121	54.7
	2	9	8	6	4	3	4	..	5	4	..	..	12	5	3	2	4.2
9.....	16	32	33	35	41	43	47	52	56	33	60	90	91	95	71	74	54.3
	2	7	8	9	8	9	6	9	5	3	8	19	12	13	7	12	8.7
10.....	25	30	36	23	17	15	19	34	20	35	43	52	35	41	50	42	32.3
	16	22	6	11	1	..	..	..	..	..	..	1	2	1	2	..	3.9
11.....	24	29	30	27	60	45	48	58	46	50	53	58	61	47	41	44	45.1
	1	..	7	3	2	3	1	1	..	1	..	2	1	..	1	..	1.4
12.....	25	42	26	39	57	50	57	72	70	76	79	59	66	72	70	103	60.2
	..	..	1	..	1	2	..	2	3	..	2	3	2	2	..	3	1.3
13.....	20	33	38	36	38	67	85	65	91	66	100	60	..	..	..	..	58.3
	4	5	7	..	6	4	7	3	7	..	3	3	..	..	..	..	4.0
14.....	27	36	31	36	30	24	35	32	43	41	35	40	47	42	36	..	35.7
	1	2	..	3	..	..	1	1	3	..	1	1	1	..	..	..	.93
15.....	32	32	48	48	58	82	68	83	89	113	88	75	104	112	94	112	77.4
	11	2	..	1	1	..	2	4	1	2	..	..	2	..	..	3	1.8
16.....	20	15	27	43	48	37	63	49	68	66	91	76	95	92	81	120	61.9
	5	6	1	1	2	2	6	..	1	3	6	4	5	1	1	4	3.0
17.....	26	11	26	27	37	45	45	48	60	40	64	67	58	43	49	..	43.1
	1	4	1	1	..	1	3	3	1	1	1	3	3	7	5	..	2.3
18.....	25	34	30	28	55	36	49	43	60	44	58	60	65	93	79	60	51.2
	10	1	..	..	..	..	..	..	..	3	..	..	..	..	9	..	1.4
19.....	17	13	24	26	26	26	36	41	39	48	66	60	58	51	48	39	38.6
	10	7	4	2	4	6	1	..	..	..	..	..	3	..	..	..	2.3
20.....	43	44	50	58	65	47	63	61	74	81	98	84	97	96	73	91	70.3
	39	44	50	58	65	1	..	1	..	2	1	6	..	1	6	1	17.2
21.....	18	37	26	33	40	34	36	27	36	54	35	47	36	..	..	..	35.3
	1	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	.23
22.....	7	23	41	38	44	33	33	55	47	56	69	101	68	82	56	83	52.3
	7	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	.56
23.....	24	17	14	13	29	54	52	50	44	59	65	40	..	..	..	..	38.4
	24	5	..	..	1	..	3	..	1	..	..	..	4	..	..	..	3.2
24.....	54	46	50	55	60	78	70	69	59	77	99	101	108	92	50	82	71.9
	54	46	50	55	60	78	70	23	17	7	20	1	13	20	17	8	34.3
25.....	51	48	41	57	69	54	78	82	107	96	115	87	122	122	116	127	85.8
	1	..	..	3	..	..	..	6	..	5	7	4	1	1	6	4	2.4
26.....	33	29	45	43	43	53	84	78	64	88	88	81	90	83	69	74	65.3
	28	8	3	..	..	..	..	2	..	..	..	..	..	..	..	..	2.6
27.....	18	14	19	38	57	54	72	106	75	75	72	74	73	61	69	..	58.5
	17	2	7	1	3	4	1	7	14	2	7	1	5	1	16	..	5.9
28.....	15	11	16	19	29	24	30	37	40	43	54	53	50	39	45	52	34.8
	2	..	1	1	1	1	2	..	4	1	1	1	..	3	1	17	2.3
29.....	14	16	12	35	36	32	23	37	60	42	53	46	..	..	..	..	33.8
	4	6	1	7	2	7	3	6	8	8	5	10	..	..	..	..	5.6
30.....	30	27	41	45	63	42	67	50	90	85	111	90	99	98	74	111	70.2
	2	1	..	1	1	4	3	..	1	1	2	10	2	1	3	3	2.1
Av...	22.6	27.6	31.2	35.8	46.9	48.0	53.9	57.7	61.5	64.7	76.6	71.6	76.0	78.1	72.3	89.0	55.8

(Final average for 30 negro girls, 55.8.)
(Final average for all errors, 4.3.)

Age.	Nationality.	School Grade.	Eye Defects.	Ear Defects.	Tonsils and Adenoids.	Health.	Cause of Commitment.
14	Negro.	4	Sl.	..	Sl.	Fairly good—Heart disease.	Incorrigibility.
16	Negro	4	..	+	..	Good.	Immorality.
15	Negro.	7	..	..	Sl.	Good.	Dependency.
16	Negro.	4	..	Sl.	..	Good.	Incorrigibility and vicious conduct.
14½	Negro.	7	Sl.	Sl.	Sl.	Fair.	Incorrigibility.
16½	Negro.	7	..	..	+	Fair.	Incorrigibility.
14	Negro.	5	..	..	Sl.	Good.	Delinquency.
16	Negro.	5	Sl.	..	..	Fair.	Incorrigibility.
15½	Negro.	4	..	..	..	Fair.	Incorrigibility.
12	Negro.	..	Sl.	..	Sl.	Good.	Incorrigibility.
14	Negro.	..	Sl.	Sl.	..	Fair.	Delinquency.
16	Negro.	4	Sl.	..	Sl.	Good.	Incorrigibility.
14	Negro.	5	..	..	Sl.	Good.	Runaway.
13½	Negro.	..	Sl.	Sl.	..	Fairly good.	Malicious mischief.
(?)	Negro.	4	Sl.	..	..	Good.	Incorrigibility.
17	Negro.	7	..	Sl.	Sl.	Fair.	Incorrigibility.
16	Negro.	4	Sl.	..	..	Good.	Delinquency.
13	Negro.	..	Sl.	..	Sl.	Fairly good.	Incorrigibility.
15½	Negro.	4	Sl.	..	Sl.	Fair.	Lewdness.
15	Negro.	4	Sl.	..	..	Good.	Delinquency.
13	Negro.	..	Sl.	Sl.	+	Fair.	Incorrigibility.
15	Negro.	4	Sl.	..	..	Underw't.	Delinquency.
14	Negro.	..	..	..	+	Convulsion.	Incorrigibility.
16	Negro.	3	..	..	+	Poor.	Unmanageable.
16	Negro.	4	+	..	..	Fair.	Incorrigibility.
16½	Negro.	4	Sl.	..	..	Fair.	Fornication.
16	Negro.	3	Sl.	..	Sl.	Good.	Incorrigibility.
18½	Negro.	2	Sl.	Sl.	..	Good.	Vicious conduct.
(?)	Negro.	..	..	Sl.	Sl.	Poor.	Delinquency.
15	Negro.	4	Sl.	..	Sl.	Good.	Delinquency.

Average age, 15.1.

them. The best group of negro girls rank in general average below the senior group of white girls. The second best group of negro girls in the school rank lower than the second group of white girls, who were among the most inferior in the school. The negro girls do not, as a rule, put as much effort into the work as the white girls, and there is apparently little rivalry among them, although this was occasionally encouraged. If a negro girl was mentioned as being very good, the others whispered something else against her, which seemed —in their mind—to offset any good qualities she might possess in this work.

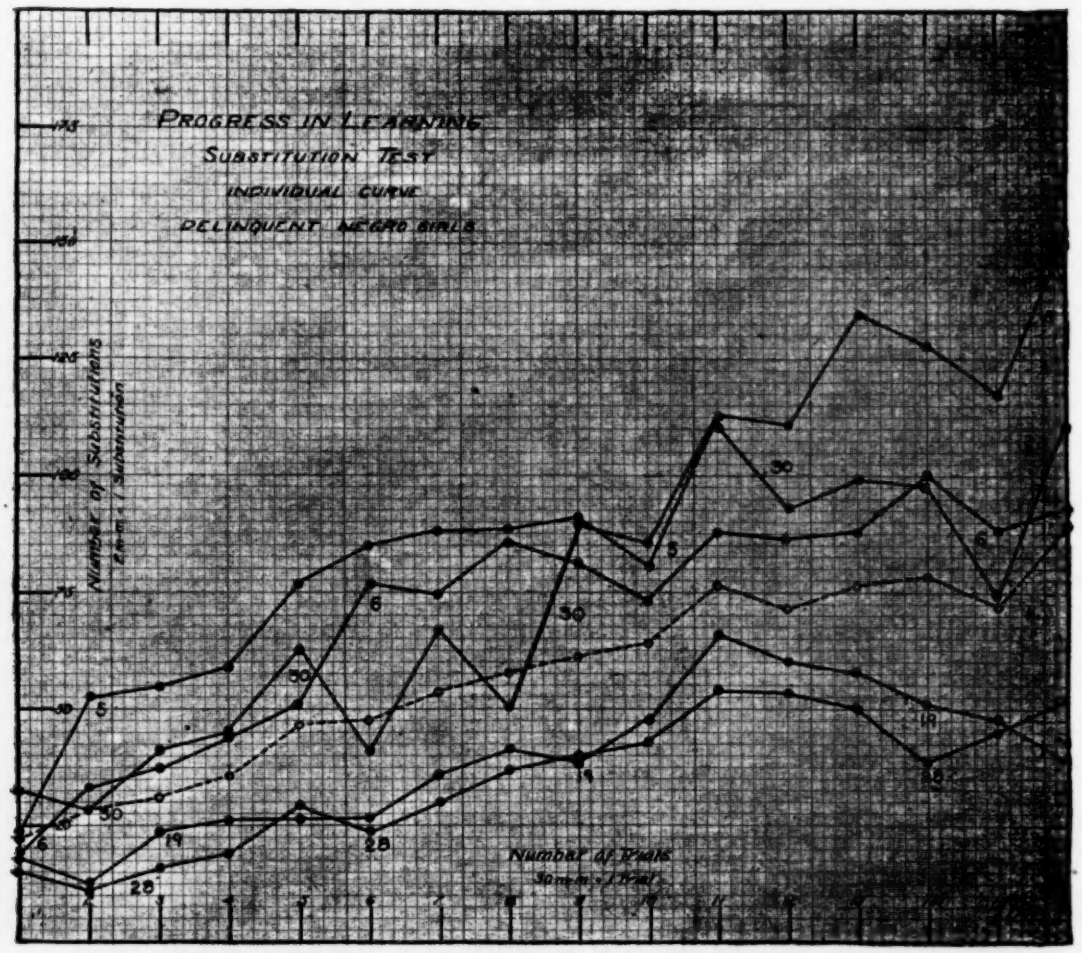


CHART II.—Progress in Learning. Delinquent Negro Girls.

In this chart, No. 5, fourteen and a half years of age, is in the seventh grade, has fair health, with slight eye and ear defects, enlarged tonsils, and was committed for incorrigibility. She is now steady in her work, and probably has the best

mind among the negro girls for intellectual work, according to her teacher's report, and according to her record in these tests. No. 30 is fifteen years of age, has good health, with slight eye defects and slightly enlarged tonsils. She is in the fourth grade, is a steady worker, and was committed for delinquency. She has not been in the school for a period as long as No. 5. No. 6 is the favorite of the school. She is light-colored, very attractive, healthy, the best singer, and one of the most reliable in the group. She is in the seventh grade, fifteen and a half years of age, and has been in the school for about two years. Her offence was incorrigibility. No. 19 claims to be fifteen and a half years of age; she is in the fourth grade, with slight eye defects, slightly enlarged tonsils and fairly good health. Her offence was lewdness. No. 28 is sixteen and a half years old, with slight eye defects. She is in the second grade, and was committed for vicious conduct.

The learning curve (not included among these charts) for the better class of negro girls tends to correspond in its direction with that of the "Senior" white girls. The average age of this group of fourteen negroes is doubtful, but it is probably above seventeen; these girls completed 62 substitutions on the average.

The curve (not included among these charts) for the second group of 16 negroes is similar to that of the larger group of newly committed white girls. There is a plateau (?) between the fifth and seventh trials, and a decided drop from the thirteenth to the fifteenth trials. This may be explained on the same basis as the lower curves for the white girls. The best girls make rapid gains toward the last trials; the poor ones reach their maximum amount of work about the seventh, eighth or ninth trials, and then drop back or continue at the same rate.

In this type of learning it is found that: 1. Comparing the amount of work done by the thirty-seven white girls with the work done by thirty negroes who accomplished more than 50 per cent. of correct results, it is evident that the negroes are decidedly inferior. The white girls made 72.3 substitutions as a general average, the negroes 55.8. The negroes accomplished 62.4 per cent. as much work as the white girls and

made 245.3 per cent. as many errors. Practically all the superior negroes in the school were included in the test.

2. The learning capacity of delinquent negro girls differs quantitatively and qualitatively from that of the white girls, and the educational corrollary follows that different methods of instruction and training are required for the negro girls than for the white girls.

3. Since many of the delinquent adolescent girls included in this investigation are of inferior mentality when measured by a substitution test, this helps to explain their moral deficiencies or causes of commitment. But since a large number of girls of both races have the ability to learn quickly, accurately and extensively, as shown by repeated trials for a given interim, it follows that the moral defects of delinquents must be partially explained on other grounds than inferior mentality.

ORAL AND SILENT READING OF FOURTH GRADE PUPILS.

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Why do our present methods of teaching reading in the grades depend almost entirely upon oral work? If the excessive amount of oral reading done in our schools is ever defended, it is generally on the grounds of the necessity for correct pronunciation, accentuation and expression. And yet correct pronunciation, accentuation and expression can all be taught by oral compositon, by teaching the child to relate stories or connected accounts. This oral composition is sadly neglected. Teachers complain incessantly that their children are unable to stand up and give a clear, connected account of any story or event. May it not be that the child has been so accustomed to read aloud, and therefore to depend upon his book, that he feels at a loss when he is called upon to do anything independently of it?

If we grant that pronunciation, accentuation and expression can be taught as well, if not better, by oral composition than by oral reading, what is there in addition to be learned by oral reading? I believe that not only is nothing to be gained by it, but that it is a direct disadvantage to the child. It is a disadvantage inasmuch as it is teaching him to articulate during the reading process, and is thus helping to form a fixed habit that he carries over into his silent reading.

Now, this habit of articulation during silent reading is one of the chief factors determining the rate of reading. It is almost universal among adults, and it would seem to be most pronounced in the slowest readers and least pronounced in the fastest. I have tried to show elsewhere[1] that it would seem

[1]Psychological Review, March, 1913.

to be a habit almost impossible to eliminate, but a habit that I do not believe to be necessary. If we cannot eliminate it entirely, it would be well not to encourage it, because it is the chief factor in retarding the rate of reading. If the rate of reading can be increased, we have gained much in this age when everybody spends a large part of his time in reading. Rapid, intelligent reading is a thing to be desired. Most practiced readers are able to glance down a page and find out whether there is anything of importance that requires more attentive perusal, but this is an accomplishment that very few ordinary people possess. There are only too many people, college students included, who must read and articulate every word before they are able to comprehend, and this fatal habit, I believe, is fostered and strengthened very largely by our methods of reading in the grades.

It might be objected to all this that articulation is necessary for a child in order that he comprehend what he is reading. That is no doubt to a great extent true, and yet it must not be forgotten that the child has this aid of articulation even when he is reading silently. There is no necessity for him to pronounce aloud to articulate perfectly. It is very doubtful whether the attention paid to pronunciation can compensate for the amount of time lost. Furthermore, it is a question whether the percentage of matter retained or comprehended is increased or diminished by this supposed help of oral reading, or whether the attention paid to the actual formation of the sounds does not detract from the amount comprehended.

The experiments to be described will try to answer this question. They were conducted under my direction by Miss E. M. Aufderheide, a student of mine and teacher of the grade experimented upon. It was the Fourth Grade, and the ages ranged from 9 to 14, with an average age of 10.4 (M. V. = 1.1). Complete experiments were made with 23 children—9 girls and 14 boys. Other children who did not attend regularly during the experiments were eliminated.

The method of conducting the work was as follows: Eight tests for silent reading and eight tests for oral reading were given. Each test consisted of reading as much as possible during a period of two minutes, although the necessity for

reading rapidly was not emphasized. All the children read the same matter. This was taken out of a supplementary reader containing stories out of the Arabian Nights. It was well within the comprehension of the grade. The books were given to the children before each test and taken away afterwards, so that no individual child might be aided in a future test by reading the next story beforehand. For the silent reading the whole class worked at the same time. For the oral work each child was taken individually by the teacher. After each test the children had to write down at once as much as they could of the matter read. Each passage was analyzed in the customary manner into the number of points or thoughts contained in it, and the papers were then graded as to the number of points reproduced.

The table printed below gives the average number of lines read and points reproduced in eight silent and eight oral tests for each of the 23 children:

TABLE I.—*Average Number of Lines Read and Points Reproduced.*

	Oral Reading.		Silent Reading.	
Obs.	Lines.	Points.	Lines.	Points.
B. R.	31	25	32	26
C. A.	20	16	23	19
F. W.	29	22	51	30
A. A.	29	24	41	26
B. A.	24	16	48	24
L. A.	31	18	30	23
R. J.	26	16	29	22
B. M.	19	11	22	19
M. W.	10	9	12	12
G. B.	16	14	25	17
W. D.	30	28	89	22
S. C.	13	6	22	10
H. B.	19	16	22	14
V. W.	18	16	25	14
O. H.	26	18	27	21
R. W.	17	9	19	14
H. S.	9	5	14	6
L. S.	12	8	17	14
C. R.	16	8	18	18
T. S.	15	8	14	12
R. Br.	15	14	25	18
G. H.	24	29	37	17
R. B.	12	6	10	7
Class Totals	461	342	652	405
Averges	20	15	28	18

The maximum number of lines read orally is 31, and silently 89; the minimum numbers are 9 and 10; the average number of lines for the whole is 20 and 28, respectively. Again, the number of points reproduced shows as a maximum 29 orally and 30 silently; the minimum numbers are 5 and 6, and the average points for the whole class are 15 orally and 18 silently.

It would seem, then, that on the whole children can read more silently than orally, even though the usual custom in the grades is to insist upon a great amount of oral reading. But more interesting than this is the fact that they would seem also to retain more of the matter read silently. The oral pronunciation of the words does not help them to retain so much more of the matter read. This is, of course, not obvious from the figures in Table I, because this table shows the actual number of points reproduced. If the child covers more ground during two minutes of silent reading, he ought to be able to reproduce more. We can see from Table I that this is generally the case. Will the child, however, reproduce a greater number of the total possible points of a long passage read silently than of a shorter passage read orally? This is given in Table II, which gives the average percentage of points reproduced for each child:

TABLE II.—*Average Percentage of Points Reproduced.*

Obs.	Age.	Oral.	Silent.	Difference.
B. R.	9	.47	.50	+ .03
C. A.	12	.43	.47	+ .05
F. W.	9	.35	.31	— .04
A. A.	9	.40	.34	— .06
B. A.	11	.33	.33	.00
L. A.	11	.34	.41	+ .07
R. J.	9	.32	.49	+ .17
B. M.	12	.19	.37	+ .18
M. W.	10	.47	.51	+ .04
G. B.	14	.34	.39	+ .05
W. D.	9	.13	.47	+ .34
S. C.	10	.43	.28	— .15
H. B.	10	.38	.41	+ .03
V. W.	10	.35	.35	.00
O. H.	11	.37	.39	+ .02
R. W.	9	.32	.50	+ .18
H. S.	9	.29	.23	— .05
L. S.	11	.28	.55	+ .27
C. R.	13	.25	.50	+ .25
T. S.	12	.27	.36	+ .09
R. Br.	10	.33	.35	+ .02
G. H.	10	.50	.33	— .17
R. B.	10	.36	.32	— .04
	—	—	—	+ 1.79
Averages	10.4	.34	.40	— .51
M. V.	1.1	.06	.07	+ 1.28

The second and third columns show the percentage of points reproduced out of the total number of points contained in the passage read by the child. The figures show the averages for the eight oral and eight silent readings. In the fourth column the differences between oral and silent reading are given, a plus sign indicating superiority in silent reading and a minus sign the reverse. It will be seen that fifteen children show superiority in silent reading, six in oral, and two show exactly the same percentage of reproduction in oral and silent reading. Again, the average percentage of points for the whole class is greater for silent reading.

I think that all this tends to show that children comprehend more when reading silently than when reading orally. The attention is not so divided between the pronunciation of the words and the matter read. My results do not show a very decided advantage on the side of silent reading, and yet I think sufficiently striking when one remembers that these children were accustomed to the usual amount of oral reading in school, and were not, as far as the teacher could tell, great readers outside of school. I am sure that silent reading would show up much better with children who had been taught to read silently in school, and I am sure that if this were done we would be training good readers, instead of training children in the habit of articulation while reading—a habit that retards the reading process and a habit that we have to try to overcome in later life in order to become fast readers.

REPORT ON THE BINET-SIMON TESTS GIVEN TO FOUR HUNDRED AND EIGHTY-THREE CHILDREN IN THE PUBLIC SCHOOLS OF KANSAS CITY, KANSAS.

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This report includes tests of four hundred and eighty-three children in the public schools of Kansas City, Kansas. The children come about equally from homes of professional people, artisans, skilled laborers, office employees, and day-laborers; they are, therefore, regarded as a very satisfactory group for such a test. They range in chronological age from 6-17 years, and in school grade from the first to the eighth. The chronological age is taken according to Goddard's usage, giving the age at the nearest birthday; thus those from 7½ to 8½ are called 8 years old.[1] This allows the use of the test grade as it stands instead of adding .5 as Terman finds necessary in his method.[2] Except for this device the children rated as Terman does would rank ½ years younger than is shown by my results. The method of reckoning is also the one used by Dr. Goddard.[3] The question as to whether this is a satisfactory method of grading will be discussed later.

The tests of pupils in Grades 1-6 were given individually, while those in Grades 7 and 8 were given in groups. A comparison of the results of these tests shows that they are sufficiently similar to allow massing the data.

I have found in giving the tests that it is necessary to allow as much as thirty minutes for each test. This is not always used, but the attempt to hurry the tests more than this tends to lead to confusion on the part of the child or to the exami-

[1]The Training School, January, 1910.
[2]Journal of Educational Psychology, March, 1912.
[3]The Training School, January, 1910.

ner's assuming that a child cannot do what he might if given a chance. When a child fails continually on test after test if he is conscious of his own failure, as he must sometimes be in spite of the examiner's efforts to encourage him, it is not wise to proceed until he merely fails from habit. But the test should continue so long as there is any chance of the child's giving an answer.

The method of procedure in giving these tests was that described by Dr. Goddard in his report on the revision of the tests.[4] By this system the child is given the mental age of the test in which he answers every question satisfactorily, and then is advanced one year for every five additional questions answered correctly. This makes allowances for individual differences by giving opportunity for selection of questions through a number of tests. However, with a standardization of the tests the need for this becomes less because children tend to answer questions through a given age, and not to select beyond that. It seems to me, however, that the failure to count anything for points less than five is a serious fault in this method of grading which should be remedied. For example, if a child eight years old passes Test VII and four points in more advanced tests, he must still be ranked only VII, or one year below normal.

An attempt to remedy this defect has been made by Terman. He allows a certain per cent. for each question answered, and the sum of these indicates the rank of the child. This seems to me more just and accurate than the method I have followed. Mr. Terman's suggested revision and extension of the tests seems to me well worth thorough proving as giving a more varied and carefully graded test and making provision for more satisfactory tests for children above the twelfth year.[5]

It is well to bear in mind in reading this paper that on account of lack of sufficient tests and of the lack of standardization of those already in use, the data for children above twelve years old, in whatever grade, are not at all satisfactory. This work with children chronologically more than twelve years is of value only for a criticism on the tests themselves.

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[4]The Training School, June, 1911.
[5]Journal of Educational Psychology, February, March, April, 1912.

TABLE A.—*Variation of Test Age from Chronological Age.*

Age.	+2.	+1.	0.	−1.	−2.	−3.	−4.	−5.	−6.	Totals.
6.....	3	5	2	..	..	..	..	..	..	10
7.....	2	24	40	1	..	..	..	..	..	67
8.....	2	11	35	14	..	..	..	..	..	62
9.....	..	11	25	19	3	..	..	..	..	58
10.....	1	8	23	12	4	1	..	..	..	49
11.....	..	12	10	13	9	..	..	..	..	44
12.....	..	..	9	27	5	4	1	..	..	46
13.....	..	..	1	17	24	6	3	1	1	53
14.....	..	..	..	..	32	17	4	..	..	53
15.....	..	..	..	..	..	17	12	2	..	31
16.....	..	..	..	..	..	..	2	5	1	8
17.....	..	..	..	..	..	..	..	..	2	2
Totals.....	8	71	145	103	77	45	22	8	4	483

Table A shows the individual variation of the Test Age from the Chronological Age of the children of each age. The first column shows the ages of those taking the tests. The last column gives the number of children of each chronological age. The headings of the columns show the variations from O, the normal. Plus variations signify that a child has passed at a test age greater than his chronological age and minus variations, that he has failed to reach a test age equal to his chronological age.

It will be seen that those chronologically from 7-10 years, the mode is normal, but only with the eight-year-olds is the distribution on either side of the mode nearly equal. Below that age the majority are above normal, and above that age the majority are below normal. The eleven-year-olds are practically normal, the majority coming within one year of normal. Above that the test age is so affected by the inadequacy of the tests as to have no value in establishing a norm. The results of the work on Tests XII seem to prove that it is too difficult for twelve-year-olds.

Table B shows the distribution of the four hundred and eighty-three children in chronological and mental age. The Arabic numbers under "Age" denote chronological age, and the Roman numbers heading the columns denote mental age. The numbers in black face show the normal frequencies. The last column is derived from the table, and shows the Median Test Age for each chronological age.

TABLE B.—*Distribution of 483 Children in Mental and Chronological Age.*

Age.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	Totals.	Median Test Age.
6.....	**2**	5	3	..	..	..	..	..	10	7.1
7.....	1	**40**	24	2	..	..	..	..	67	7.31
8.....	..	14	**35**	11	2	..	..	..	62	7.97
9.....	..	3	19	**25**	11	..	..	..	58	8.78
10.....	..	1	4	12	**23**	8	1	..	49	9.83
11.....	..	..	..	9	13	**10**	12	..	44	10.6
12.....	..	..	1	4	5	27	**9**	..	46	10.98
13.....	..	1	1	3	6	24	17	**1**	53	11.14
14.....	..	..	..	..	4	17	32	..	53	11.67
15.....	..	..	..	..	2	12	17	..	31	11.58
16.....	..	..	..	..	1	5	2	..	8	11.1
17.....	..	..	..	..	..	2	..	..	2	11.
Totals..	3	64	87	66	67	115	90	1	483	

TABLE C.—*Grade Distribution Related to Chronological Age.*

	Grades.												
	1.	2.	3.	4.	5.	6.	7.	8.					
Chron.	Normal Age for Grade.								No.	In normal	Re-	Ad-	Below school
Age.	7.	8.	9.	10.	11.	12.	13.	14.	tested.	grade.	tarded.	vanced.	age.
6.....	10	..	..	..	..	..	..	..	10	10	0	0	10
7.....	**62**	5	..	..	..	..	..	..	67	64	0	3	..
8.....	22	**35**	5	..	..	..	..	..	62	35	22	5	..
9.....	8	16	**27**	7	..	..	..	..	58	27	24	7	..
10.....	2	4	19	**20**	4	..	..	..	49	20	25	4	..
11.....	..	..	7	17	**15**	5	..	..	44	15	24	5	..
12.....	..	1	1	6	19	**19**	..	..	46	19	27	0	..
13.....	..	1	3	6	14	17	**9**	3	53	9	41	3	..
14.....	..	..	..	..	7	8	19	**19**	53	19	34	0	..
15.....	..	..	..	..	1	3	4	**23**	31	0	31	0	..
16.....	..	..	..	..	..	..	..	8	8	0	8	0	..
17.....	..	..	..	..	..	1	..	1	2	0	2	0	..
Totals..	104	62	62	56	60	53	32	54	483	218	238	27	10
										45.1%	49.3%	5.6%	

Table C gives for each school grade the distribution with regard to chronological age. The first vertical column shows the chronological age. The numbers at the top of the other vertical columns show the School Grades, and the second horizontal row shows the normal age for each grade. The numbers in black face show those placed normally. In Grades 1-4 the mode is normal, and also in Grade 6. Grade 7 is the only one where there is any great discrepancy. (A discrepancy of one year in the upper grades of our school can easily be accounted for because for only three years have children been

admitted under seven years of age.) However, while the mode is normal, it will be seen that a much larger number are retarded than are advanced in all the grades.

TABLE D.—*Grade Distribution Related to Mental Age.*

	Grades.												
	1.	2.	3.	4.	5.	6.	7.	8.		No. in			Below
Mental	Normal Age for Grade.								No.	normal	Re-	Ad-	school
Age.	7.	8.	9.	10.	11.	12.	13.	14.	tested.	grade.	tarded.	vanced.	age.
VI	3	..	..	..	..	..	..	..	3	3	0	0	3
VII	**61**	3	..	..	..	..	..	..	64	61	0	3	..
VIII	39	**39**	8	1	..	..	..	..	87	39	39	9	..
IX	1	17	**38**	8	2	..	..	..	66	38	18	10	..
X	..	3	15	**35**	11	2	0	1	67	35	18	14	..
XI	..	..	1	10	**34**	26	15	20	106	34	11	61	..
XII	..	..	..	2	13	**25**	17	32	89	25	15	49	..
XIII	..	..	..	..	..	..	**0**	1	1	0	1	0	..
XIV	..	..	..	..	..	..	..	**0**	0	0	0	0	..
Totals..	104	62	62	56	60	53	32	54	483	235	102	146	3
										48.7%	21.1%	30.2%	

Table D shows the correlation of the mental age with the normal age for the grade. The arrangement of the table is like Table C, except that the Roman numbers in the first column give the mental ages. It will be noticed that here the correlation is much closer than between the chronological and mental ages as shown in Table B, or between the chronological and normal age for grade as shown in Table C. This seems to prove that the classification in this school follows closely the mental maturity of the child. Considering one year above or below as satisfactory, it will be seen that there is no important variation until Grade 7 is reached, and the sudden drop there is due to the lack of proper tests for determining the mental status of the child. The normal ages for Grades 7 and 8 are thirteen and fourteen years, respectively. Since there are no tests for these years, the children cannot be expected to reach these ages, and, as before stated, the data gained here are of no use except as a criticism on the tests.

TABLE E.—*Showing Relation of Median Grade Age and Median Grade Test Age to Median Test Age.*

Normal Chron. Age.	Derived from— Table B. Median Test Age.	School Grade.	Table C. Median Grade Age.	Table D. Median Grade Test Age.
7.....	7.31	1	7.17	7.3
8.....	7.97	2	8.24	8.21
9.....	8.78	3	9.46	9.1
10.....	9.83	4	10.55	10.4
11.....	10.6	5	12.07	11.00
12.....	10.98	6	12.64	11.44
13.....	11.14	7	13.86	11.55
14.....	11.67	8	14.71	11.68

Table E in the fifth column gives the Median Test Age for each grade. This is derived from Table D.

In Table E the fourth column is derived from Table C, and shows the Median Chronological Age for each grade, the third column indicating the number of the grade.

In Table F are shown the results on each question of each test from all who took the tests. In the first column the Roman numbers denote the test, and the Arabic numbers under each the separate questions. The numbers at the head of the other columns show the chronological ages. In each column the number at the left shows those who passed, and the right-hand number those who failed on the question.

All the children under nine years make a fair record through Test VIII. Suddenly on Test IX there is a marked falling off in the number who succeed. Not only is this so, but the eight and nine-year-olds succeed better on Test X than on Test IX, and the nine-year-olds did better even on Test XI.

These figures make it desirable to look at Test IX rather carefully. A glance at Test IX throughout the report shows that of ten-year-olds about 23 per cent. failed, except on question 5, where 35 per cent. failed. Of the eleven-year-olds on this same test the smallest failure was on question 4—11 per cent. —while on questions 1 and 5, 27 per cent. failed. The number taking the test beyond this is too small to use for proof, but even here there was trouble with 1 and 5 more than once. Naturally, one should not expect that six, seven and eight-year-olds should pass satisfactorily Test IX, intended for nine-year-olds, but the sudden marked increase of failure at

Table F. Report on each question of tests.

Test No.	Chron. Age.	6	7	8	9	10	11	12	13	14	15	16	17	Titles of Tests.
V.	1.....	4-0	12-0	5-0	1-0	...	....	....	....	....	....	....	....	Compare 6 and 15 grams; 9 and 18 grams.
	2.....	4-0	12-0	5-0	1-0	...	....	....	....	....	....	....	....	Copies square.
	3.....	4-0	12-0	5-0	1-0	...	....	....	....	....	....	....	....	Repeats, "His name is John. He is a very good boy."
	4.....	4-0	12-0	5-0	1-0	....	....	....	....	....	....	....	....	Counts four pennies.
	5.....	4-0	12-0	5-0	1-0	....	....	....	....	....	....	....	....	Patience.
VI.	1.....	7-0	40-0	13-1	2-0	1-0	....	....	....	....	....	....	....	Morning or afternoon.
	2.....	7-0	39-1	13-1	2-0	1-0	....	....	....	....	....	....	....	Defines fork, table, chair, horse, mama.
	3.....	5-2	30-10	11-3	1-1	1-0	....	....	....	....	....	....	....	Puts key on chair, brings box, shuts door.
	4.....	6-1	35-5	13-1	2-0	1-0	....	....	....	....	....	....	....	Shows right hand and left ear.
	5.....	6-1	38-2	13-1	2-0	1-0	....	....	....	....	....	....	....	Chooses prettier.
VII.	1.....	10-0	65-0	28-0	7-0	3-0	....	1-0	2-0	....	1-0	....	....	Counts 13 pennies.
	2.....	10-0	58-7	26-2	7-0	3-0	....	1-0	2-0	....	1-0	....	....	Describes picture.
	3.....	9-1	57-8	27-1	7-0	3-0	....	1-0	2-0	....	1-0	....	....	Sees lack in pictures.
	4.....	7-3	48-17	24-4	6-1	2-1	....	1-0	2-0	....	1-0	....	....	Copies diamond.
	5.....	9-1	64-1	27-1	7-0	3-0	....	1-0	2-0	....	1-0	....	....	Names colors—blue, red, yellow, green.
VIII.	1.....	9-1	59-7	60-0	51-0	25-0	12-0	4-0	10-0	2-0	2-0	1-0	....	Compares objects from memory.
	2.....	6-4	31-35	47-13	45-6	24-1	12-0	3-1	8-2	2-0	2-0	1-0	....	Counts backwards 20-1.
	3.....	6-4	46-20	54-6	50-1	23-2	12-0	4-0	9-1	2-0	2-0	1-0	....	Days of week.
	4.....	6-4	27-39	45-15	48-3	23-2	12-0	4-0	9-1	2-0	1-1	1-0	....	Counts stamps 1 1 1 2 2 2.
	5.....	7-3	58-8	56-4	45-6	24-1	12-0	4-0	9-1	2-0	1-1	1-0	....	Repeats 5 figures 4, 7, 3, 9, 5.
IX.	1.....	1-9	3-63	17-45	28-30	29-9	13-5	7-2	6-5	2-1	0-2	0-1	....	Makes change—20c.-4c.
	2.....	2-8	19-47	30-32	45-13	28-9	15-3	8-1	7-4	3-0	2-0	0-1	....	Definitions better than use. See VI, 2.
	3.....	1-9	7-59	9-53	30-28	30-7	14-4	7-2	9-2	3-0	2-0	1-0	....	Knows date.
	4.....	0-10	0-66	7-55	29-29	28-9	16-2	8-1	10-1	3-0	2-0	1-0	....	Tell months in order.
	5.....	2-8	23-43	26-36	23-35	20-17	13-5	7-2	3-8	1-2	2-0	0-1	....	Arranges weights.
X.	1.....	3-7	11-55	19-18	43-8	45-2	25-3	21-1	19-2	20-0	17-0	5-0	2-0	Knows money—1c., 5c., 10c., 25c., 50c., $1, $2, $5, $10.
	2.....	....	....	4-33	16-35	23-24	13-15	16-6	13-8	18-2	15-2	5-0	2-0	Copies design.
	3.....	2-8	11-55	24-13	43-8	40-7	22-6	20-2	16-5	19-1	15-2	5-0	2-0	Repeats 6 figures.
	4.....	....	2-64	17-20	30-21	34-3	23-5	21-1	18-3	20-0	16-1	5-0	2-0	Questions of comprehension.
	5.....	....	1-65	14-23	24-27	34-3	22-6	19-3	17-4	19-1	17-0	4-1	2-0	Use 3 words in 2 sentences.
XI.	1.....	....	1-0	3-6	12-8	29-9	29-10	36-6	46-4	48-4	28-3	7-1	1-1	Sees absurdity.
	2.....	....	....	9-0	20-0	33-5	37-2	42-0	46-4	50-2	31-0	7-1	2-0	Uses 3 words in a single sentence. See X, 5.
	3.....	....	....	0-9	12-8	20-18	31-8	40-2	44-6	48-4	28-3	6-2	2-0	60 words in 3 minutes.
	4.....	....	....	1-8	10-10	18-20	30-9	39-3	43-7	48-4	20-11	5-3	1-1	3 rhymes.
	5.....	....	....	0-9	2-18	8-30	19-20	27-15	37-13	44-8	25-6	7-1	2-0	Arranges dissected sentences.
XII.	1.....	....	....	....	....	5-3	12-17	19-19	18-24	39-14	23-8	6-2	1-1	Repeats 7 figures.
	2.....	....	....	....	....	4-4	7-12	16-22	25-17	39-14	23-8	8-0	1-1	Defines charity, goodness, justice.
	3.....	....	....	....	....	4-4	12-7	21-17	24-18	38-15	24-7	6-2	2-0	Repeats sentence of 26 syllables.
	4.....	....	....	....	....	3-5	4-15	8-30	9-33	11-42	6-25	1-7	0-2	Resists suggestion.
	5.....	....	....	....	....	1-7	8-11	14-24	16-26	23-30	10-21	3-5	1-1	Problems.
XV.	1.....	....	....	....	....	4-11	9-16	10-26	17-25	21-32	10-21	2-6	0-2	Interprets picture.
	2.....	....	....	....	....	2-13	11-14	14-22	16-26	20-33	22-9	1-7	1-1	Changes hands of clock.
	3.....	....	....	....	....	1-14	4-21	4-32	9-33	15-38	11-20	2-6	0-2	Code.
	4.....	....	....	....	3-0	14-1	24-1	36-0	40-2	50-3	29-2	7-1	1-1	Opposites.

this place, together with the difficulty that older children have with this test, seems to show that it is too difficult for this age. There is a greater gap between Tests VIII and IX than between any other two consecutive tests. I am not clear in my own mind as to the reason for this. It is possible that this test is more nearly a test of training than of native ability. However, that could not be true with question 5, arranging weights, on which at seven, eight and nine years more than 50 per cent. failed, and nearly 46 per cent. of ten-year-olds. Questions 1, making change; 3, giving date; and 4, naming months; I do believe were strongly affected by training. A child frequently made the excuse, "I have not learned that yet." Question 2, definitions better than use, gave less trouble to nine-year-olds, only 22 per cent. failing, but the ten-year-olds found it just as difficult as 1 and 4. In Test X, question 2, copying designs gives more difficulty than any other, and seems to be the only one misplaced. Not only the ten-year-olds, but eleven, twelve and thirteen year-olds found trouble here.

By comparison of X 5, and XI 2, constructing a sentence containing three given words, it will be seen that among the ten-year-olds practically all who answered the question at all satisfactorily reach an eleven-year credit, which requires that the three words be used in a single sentence instead of in two sentences, as in Test X. Also, that question 1, absurdities, and 3, sixty words in three minutes, are easier for ten-year-olds than X 2.

Test XII, by the results of this test, seems too difficult for twelve, thirteen and fourteen-year olds, since the best record on any question made by children of these ages is 26 per cent. failures on question 1, repetition of seven figures, and question 2, definitions of abstract terms by fourteen-year-olds. Even fifteen and sixteen year-olds have more than 50 per cent. failures on question 4, suggestibility, and question 5, problems. Test XV 4, is in our schools a test of training, because in Grades 5 and 6 antonyms are taught. This accounts for the fact that so many ten and eleven year-olds passed, and that there were practically no failures on this question. The other questions, as might be expected, are too difficult for twelve, thirteen and fourteen-year olds, and even fifteen year-olds

have a large per cent. of failure. Returning to Test X, question 4, there is a part of this question that seems to me very poorly graded. In series 2, question 3, "Why would you excuse a person for doing wrong when angry more than if he was not angry?" and question 5, "Why would you judge a person more by his acts than by his words?" seem to me much more difficult than any of the other questions, and they proved to be so to the children. Bobertag says that they should be eliminated because even an ignorant adult could not give a satisfactory answer to them.[6]

Table G shows how many children are at, above or below school grade according to chronological age, assuming seven years as the normal for the first grade, eight years for the second, and so on. It also shows the number at, above or below school grade according to the Binet system of measurement. In the latter tabulation I have given the entire result, and the result after taking out those of the seventh and eighth grades. This is done because the normal ages for grades 7 and 8 are thirteen and fourteen years, respectively, and there are no tests for those ages; also to allow comparison with other reports of such work that have not included Grades 7 and 8. A comparison of numbers 1 and 7 shows that while forty-three are above grade according to school standard, two hundred thirty-seven, nearly six times as many, are below grade by the same standard. A comparison of numbers 3 and 6 shows that sixty-four are in grades beyond what their mental ability warrants, while one hundred one are below where their mental ability would place them. This latter is far nearer a normal distribution, since instead of six times as many, as in the first instance, not quite twice as many are retarded as are advanced. Comparing numbers 4 and 6 shows two hundred three in the right grade by school standard, and one hundred forty-seven by Binet standard, a difference of about 5 per cent.

It will be seen that even omitting Grades 7 and 8, a larger number are advanced beyond their normal grade as measured by the Binet scale than according to chronological age (numbers 1 and 3); that a smaller number are in the right grade

[6] Otto Bobertag. Zeitschrift für angewandte Psychologie, May, 1911.

TABLE G.—*Showing Position in School Related to School Standard and to Binet Standard.*

	This report.		Goddard's figures.	
	No.	%	No.	%
1. Above grade according to School Standard. (Table C.)	43	8.8	150	11.6
2. No. in grades ahead of what their mental ability measured by Binet scale warrants. (Table D.)	150	30.9	...	...
3. Same, omitting Grades 7 and 8	64	16.0	121	9.4
4. In right grade according to School Standard. (Table C.)	203	41.9	393	30.0
5. In right grade according to Binet Standard. (Table D.)	233	48.1	...	...
6. Same, omitting Grades 7 and 8	147	36.9	558	43.2
7. Below grades according to School Standard. (Table C.)	237	48.9	659	51.1
8. In grades below what mental ability warrants. (Table D.)	101	20.8	...	...
9. Same, omitting Grades 7 and 8	101	25.3	558	43.2

By Years of Retardation. (This Report.)

	1 yr.	2 yr.	3 yr.	4 yr.	5 yr.	6 yr.
1. Retarded according to School Standard. (Table C.)	150	52	20	5	2	..
2. Backward according to Binet Scale. (Table D.)	103	77	45	22	8	2
3. In school grade below that which their mental ability warrants. (Table D.)	94	7	..	..	..	..

Goddard's Figures for Above.

1. Retarded according to School Standard	361	186	90	22	..	..
2. Backward according to Binet Scale	312	156	79	37	..	..
3. In school grade below that which their mental ability warrants	449	90	8	..	..	..

according to the Binet scale (numbers 4 and 6); and a smaller number are below by this scale (numbers 7 and 9). This result does not agree with Dr. Goddard's findings—that a smaller number are above and below according to the Binet scale, and more in the right grade than according to the chronological scale. His figures are given in columns 3 and 4.[7]

The part of the table showing results by years of retardation gives opportunity for comparisons. While at one year a smaller number are backward according to the Binet Scale than are retarded according to the school system beyond that at two, three, four, five and six years' retardation, more are backward according to the Binet Scale than are retarded in the school system. Here, again, we are at variance with Dr. Goddard's report that shows up to four years' less retardation by Binet than by school standard.

It will be of interest to compare Tables C and D for the purpose of discovering how many children are properly classified chronologically and mentally. Looking at the totals, Table C, we find of four hundred eighty-three children tested, two hundred eighteen, or 45.1 per cent., are in the normal grade; two hundred thirty-eight, or 49.3 per cent., are retarded, while only twenty-seven, or 5.6 per cent., are advanced.

In Table D, showing the grade distribution according to mental age, the totals show of the four hundred eighty-three children tested, two hundred thirty-five, or 48.7 per cent., in the right grade; one hundred two, or 21.1 per cent., retarded, and one hundred forty-six, or 30.2 per cent., advanced. That is, measured by the Binet standard, more are in the normal grade, less than one-half as many retarded, and nearly six times as many advanced as when measured by the Chronological Standard. Goddard's report, above referred to pp. 244-245, shows gradation according to the physical age, 30.4 per cent. in the normal grade, 51 per cent. retarded, and 11.7 per cent, advanced. While the number retarded approximates our findings, there are fewer in the normal grade, and twice as many advanced as we find.

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[7]H. H. GODDARD. *Two Thousand Normal Children Measured by the Binet Measuring Scale of Intelligence.* Pedagogical Seminary, June, 1911, pp. 232-259.

The result is very different in comparing the distribution according to mental age. Goddard finds 43.2 per cent. in normal grade against our 48.7 per cent. he finds 42.4 per cent retarded, twice as many as our report shows; while he finds only 9.4 per cent. advanced, where we find 30.2 per cent—more than three times as many. Dr. Goddard places the normal age for the grade one year lower than we have been compelled to use by our school standard, but since the comparison is made in per cents., I do not think this renders the results incomparable.

Our result seems to show, as Dr. Goddard suggests, that the perfection of such a series of tests as this would be of great value for use in the more accurate grading of the children in the public schools. Dr. Goddard's words in the report we are quoting, p. 249, may well apply to this report, "It is almost beyond the bounds of possibility that we could get such figures as are shown in this Table unless the figures upon which it is based are amazingly accurate, and if they are accurate, it gives us a wonderfully valuable method of measuring our efficiency and our accuracy in the grading of children, and points out the possibility of great improvement along this line—much to the advantage of the children and the comfort of the teacher."

With many of our prominent educators working toward this end, we may hope that in the future a system may be worked out that will assist in an accurate grading of our children according to efficiency and maturity in a scientific manner.

SUPPLEMENTARY REPORTS.

1. *Report of the tests of forty "1B" children given within ten days of their admission to school and comparison of the tests of twenty-two of them with tests given six months later when they were "1A."*

The purpose in giving this test was to attempt to learn something of the mental standing of the children before they were affected by conscious, definite training. For this reason the whole class was tested before they had been in school ten days.

The class of forty "1B" children range in age from five-seven years. The tests began with Test VI, and all were carried

through Test IX. Those who showed any sign of further ability were tested on parts of Tests X and XI. The accompanying table shows the age distribution, the Roman numbers showing the age according to the Binet Scale, and the Arabic numbers under age denoting the chronological age.

Age	V	VI	VII	VIII	Totals
5	1				1
6	1	28	5	2	36
7		2	1		3
Totals	1	31	6	2	40

In chronological age all but one, five years old, are the normal age for the grade. In mental age one falls one year below and two are one year above the Ayres' Standard, 6-7. It will be seen, therefore, that the distribution curve is normal, and that the class approximates perfection in this work. By this table it will be seen that three are one year below normal, twenty-nine normal, six one year above normal and two two years above. The part of this class who entered the "1A" group at the beginning of the second term were tested again six months after the first test. Because our compulsory education laws have no effect on children under eight years, many are irregular during their first term, or drop out altogether. For this reason, and because of removals from the district, only twenty-two are available for the comparison.

The following comparisons are made on the basis of the same chronological age for each child at each test. Of three who made no gain in mental age, one was normal, one one year above normal, and one two years above normal. Of fourteen who gained one year, one was one year below normal at the first test and normal at the second test, eleven were normal at the first, and one year above after six months in school, two were one year above at the first test, and two years above at the second. Of the five who gained two years mentally, all were normal at the first test.

This seems to show a very marked influence of training in the first term of school. It might be argued that the first test had prepared for the second. The facts on which I base my opinion that this is not so are these: On the first test only three who took both tests passed Test VII. All were told that they had done well. If any memory influenced the second test,

it would have been one that would have caused failure, yet at the second test fifteen passed Test VII. No one who took both tests passed Test VIII the first time, though they were given to understand that their work was satisfactory, and on the second test three passed Test VIII. At the second test, besides the three who passed the entire test nineteen passed part of Test VIII. At the first test six answered one question on Test IX. At the second thirteen answered one question, and one answered two questions. All except question 1 was answered by some. At the first test no one answered any question on Test X. At the second test five passed question 3, repeating six figures, and one of these passed also question 1, knowing money.

A comparison of the work of twenty-five children on tests given at an interval of one year.

When first tested, early in 1911, the class was "1A." The second test was conducted in the same way by the same examiner early in 1912, when the children were "2A." In 1911 the class consisted of forty children. Fifteen of these were lost by removal, so that only twenty-five were available for comparison.

The object of giving this test was to discover whether anything could be learned as to the mental growth in one year, and its relation to the physical growth.

In the first test, as the children ranged in age from six to nine, I began with Test VI. Eighteen passed Test VII and four passed Test VIII. In the second test I began with Test VIII. Only five failed to pass this test, and all but one of these passed Test VII. The one who failed was a girl who had to take Test V for a perfect record. She had had to do the same at the first test. She showed a gain of one year, but was one year below normal at each test. No one passed Test IX, though eight made a sufficient number of points beyond Test VIII to be ranked nine years, and one, a little girl of eight years, made a ten-year rank.

In comparing the two tests I find that six made no gain in mental age in the year. Of these one was normal at the first test, and failed by one year to equal his physical age on the second test. The other five were one year above normal on

the first test, and normal on the second. Fourteen made the normal gain of one year in mental age. Of these nine were normal in both tests, three were one year below normal each time, one was one year above, and one was two years above each time. Five made a two-year gain in mental standing in one year. Of these one was two years below normal at the first test, and one year below at the second, one was one year below at the first test and normal at the second, two were normal at the first test and one year above at the second.

No attempt has been made in this report to analyze the kind of answers, or to draw any conclusions with regard to the tests themselves. This is treated in the main report, of which this is a supplement.

COMMUNICATIONS AND DISCUSSIONS.

WHAT CONSTITUTES EXPERIMENTAL PROOF? CRITIQUE OF AN OPEN-WINDOW EXPERIMENT.

It has been said often enough not to need reiteration that the essence of experiment is observation under controlled or standardized conditions, and again that experiment aims to replace opinion by objective demonstration. The reason why we use instruments of precision and statistical methods in scientific work is to meet these requirements of control and objectivity.

The movement for open-window classrooms is one of those developments in educational practice that by very novelty stand much in need of real experimental scrutiny. When we make so radical a change as to remove a group of pupils from the ordinary classroom to the open air, we immediately vary simultaneously a considerable number of conditions. Two questions arise: what is the actual effect, mental, physical or moral, of these changes? And which of the altered conditions—temperature, humidity, light, novelty, increased freedom, altered chemical or physiological aspects of the air, and perhaps better feeding—which of these altered conditions are really producing the observed effects?

I have been much struck by the circumstance that those in control of the pioneer open-air classroom—the Charlottenburg Forest School—have given up the idea of conducting regular class exercises out of doors in cold weather and have returned to the use of what is virtually a warmed room. This has led me to read with much interest a recent pamphlet by Dr. W. W. Roach[1] of Philadelphia, which seems to me to exhibit so many methodological faults as to warrant consideration on that score in these columns.

If we are to make real progress in education, we must not merely adopt the outward semblance of experimentation, but follow rigorously the precautions, the checks, the standards of verification and

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[1] *Revitalizing Devitalized Children: An Open Window Experiment.* Reprinted from the *American Journal of Public Health*, Vol. 3, No. 2, pp. 13.

proof that characterize the man of science in the laboratory, or, if that be impossible, we must make clear in what respects our experiments lack conclusiveness and hope for confirmation or correction of our findings by subsequent investigators.

With these thoughts in mind, I trust I shall not be accused of condemning the open-air schools (which I regard as a highly interesting, though not yet sufficiently studied movement), if I venture upon some comments upon the methodological aspects of Dr. Roach's paper.

At the Bache School, Philadelphia, during the winter session of 1912, forty-four third-grade pupils were placed in a classroom with heat cut off (save on very cold days) and with windows as widely open, above and below, as the sashes would permit. Desk chairs were used for routine work, but so arranged as to be readily moved aside by the pupils to clear the floor space for physical exercise. Woolen blankets, sweaters, caps, gloves, etc., were provided for use in very cold temperatures; otherwise the equipment and work of the class were like that of another third-grade class used for comparison and housed in the same building in an ordinary heated classroom. No definite record of the temperatures of the two rooms is given, but apparently the colder room was not allowed to fall much below 50° F. The pupils were not tubercular, nor were they fed at the school. In each room there were a number physically and pedagogically retarded.

Now, the net factual results of this experiment, so far as I can gather them from Dr. Roach, appear to be that in twelve weeks the average gain in weight was for the fresh air room two pounds, for the regular room one pound. If this result be doubtful, the experiment seems not to have *proved anything.*

In the first place this result has no statistical significance. When we are dealing with averages, we must remember that a difference between two averages has claim to scientific standing only when its magnitude is shown to be at least twice as great as its variability. Dr. Roach does not compute the reliability of this difference. He gives a full account of the weight of each child before the experiment, but only their average weight after the experiment, so that we have no idea how the gain in weight was distributed. Since the mean variation of the open-window class before the experiment is, according to my calculations, about 6 or 10 per cent. of the average weight,

60.75 pounds, we may expect that there is considerable variability in the gain of the pupils during the twelve weeks of the experiment.

In the second place, we find (pp. 11 and 12) that the teacher of the "warm room" was "naturally anxious that her pupils should compare favorably in every way with those taught in the open-window room, and the medical supervisor *could not consistently ask her to keep her windows closed* and deny to her pupils the fresh air to which he knew they were entitled, so in the early fall *they also gained in weight (!), and it was not until cold weather set in late in November that they were in very warm air*" (italics mine). I can gather no other conclusion from this than that the alleged three months' experiment actually lasted about *four weeks!*

And thirdly, we find that the average weight of the two classes before the experiment was: for boys, open-window class 61.04 pounds, warm-room class 64.67 pounds; for girls, open-window class 60.15 pounds, warm-room class 68.41 pounds. Query: should we expect the warm-room class, whose boys averaged 3.63 pounds and whose girls averaged 8.26 pounds more than the open-window class before the experiment began, to gain as much as the open-window class?

So much for the facts about the gain in weight. Evidently they prove nothing. But there are some other features of the article that deserve a word of comment. Take, for one, the declaration of Dr. Roach (p. 8) that: "Expired air at body temperature and exhaled gases at over 90° F., set free in the cold-air room, rise rapidly to the ceiling and pass out the upper window openings, being replaced by the pure air coming in the lower window openings." How precisely was this determined? We have no record in the paper of CO_2 tests of air at different levels. As a matter of fact, this statement is almost certainly incorrect, for whenever accurate tests, as by the Pettersson-Palmquist apparatus, have been made of air at different levels, it has been shown that expired air is immediately diffused in the schoolroom, so that the carbon dioxid quotient is the same near the floor, near the ceiling, and at the breathing line.[1]

Turning to the mental effects of the fresh-air room, we note that Dr. Roach declares (p. 12), after citing the gains in weight, that: "The class work of the fresh-air children has shown improvement in

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[1]See, for example, the report made under the writer's direction by W. E. McGown, *Report on the Hygienic and Sanitary Condition of a Public School Building.* Ped. Sem., 27: 1910, 480-490.

the same marked degree. They enjoy study in the cool air and learn rapidly. *Results show it.*" Directly below this assertion is a communication from Principal W. C. Bishop, in which occur the following statements: "You ask my opinion as to what effect the open windows had upon the mental activity of the children. * * * While the time has been short and the weather unfavorable for exhaustive study, I am of the opinion that as the temperature falls to 50 degrees, day-dreaming on the part of particular pupils decreases and the alertness of the whole class increases. This means better attention and more effective work. *To prove that these conclusions are founded upon fact is a difficult task.*" This statement is not quite in accord with the positiveness of the medical inspector.

There follows a brief statement of three test exercises—learning and writing four lines of poetry, solving four simple arithmetical problems and writing 15 difficult words. "While," concludes Mr. Bishop, "the results can hardly be called a proof of our claims, we believe with our other observations that they are straws that show the direction in which the wind is blowing and shall continue our study of the subject." This reluctance of the principal to place positive insistence on the outcome of these tests is amply justified, as any one will admit, by the fact that, so far as we are informed at least, *no preliminary check tests had been instituted to compare the relative school efficiency of the two classes before the experiment began.*

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SILENT AND CONCERTED LEARNING.

In these days much is heard about 'individual work' in schools and of the futility of the attempts made to teach children in a 'wholesale' fashion. Nevertheless, many an experienced class teacher has almost an affectionate regard for the old practice of collective repetition. Should anyone venture to cast a doubt on the potency of this procedure, its supporters will at once cite the fact that very few teachers ever think of teaching a class a song other than simultaneously; and that 'the poetry for recitation' is most easily learnt by concerted repetition by the whole class. Many cogent reasons can, no doubt, be brought forward to justify this method of teaching certain subjects; and the present limited investigation can only throw a little light upon one aspect of the problem. The question

which prompted this experiment in education was: "Does a class learn a poem more quickly when the pupils repeat it aloud simultaneously or when each pupil learns it silently and independently?"

Method.

The method of procedure resembled that employed by Winch in much of his recent work.[1] A class was divided into two sections of equal ability in learning poetry. This was done on the basis of a preliminary test in learning a poem of twenty lines. The two sections of the class thus obtained, which will be referred to as Sections A and B, were given the first half of a poem[2] to learn, which consisted of twenty-four lines. Each pupil was given a separate copy. Before the pupils were told that they would be expected to learn it, the teacher explained briefly any words and phrases likely to be strange to the class. The pupils in Section A memorized silently, whilst Section B repeated the stanzas aloud in another classroom, so as not to interfere with Section A, as both sections worked concurrently. Eight minutes were given to the upper class (Standard 6, average age 12), and ten minutes to the lower class (Standard 4, average age 10), to learn as much as possible. It was assumed that these periods were short enough to prevent any pupil learning the whole poem set; and this presumption was justified by the results obtained. The pupils were told to learn the poem by the 'entire method;' that is, by reading it from beginning to end and not by concentrating upon one stanza at a time. Whilst this condition could be enforced in the concerted learning, we could not be certain that every child in the 'silent' group adopted this method; but the fact that in the subsequent test they were able to reproduce more of the last stanza than of the intermediate ones seems to indicate that this instruction was generally complied with. After the times specified above, each pupil was requested to write as much as she could remember, and in case a certain stanza, line or word could not be recalled, she should leave a blank and proceed to the next part remembered.

On the next day the method of learning was reversed, Section A memorizing in concert and Section B silently. The latter half of the

[1]See especially WINCH, *The Transfer of Improvement in Memory in School Children*, British Journal of Psychology, January, 1908, and December, 1910; and WINCH, *Mental Fatigue in Evening Schools*, Journal of Educational Psychology, January and February, 1910.

[2]The poem given was "Swinging on a Birch Tree," by Lucy Larcom.

same poem was given, the times were the same, and as far as possible the conditions were similar to those of the previous day.

As the lines of the poem given were short and of uniform construction,[3] the marking presented but little difficulty. One mark was given for each line correctly reproduced, and decimal fractions for those lines only partially recalled—meaning, correctness of words and of their order, being borne in mind when assessing the marks; but no marks were deducted for mistakes in spelling when it was obvious that the pupil had the right word. In order to minimize the possible influence of the "personal equation," all the papers were marked by two persons in consultation.

The above procedure was followed with two girls' classes in an average elementary school, and the results are given in Table I. Other experiments were made with four classes in a boys' school, but all the above conditions were not fulfilled. Thus, no preliminary memory test was given, the class being divided into two sections by taking alternate names on the class list of the most recent examination. Another condition not complied with was that the converse experiment was not performed; that is, the section tested with the silent learning was not tried with simultaneous learning. The time given to memorize was six minutes to St. 4 and 5 and eight minutes to St. 2 and 3. The poem memorized was also different from that given in the experiments previously described.[4] Notwithstanding these differences and deficiencies, we include the results separately (Table II), as they lend support to the more carefully obtained results of Table I.

[3]The following will suffice to illustrate the matter learnt:

Swinging on a birch-tree
To a sleepy tune,
Hummed by all the breezes
In the month of June!

[4]The poem in this case was "The Curfew."

TABLE I.

Maximum Marks: 24.

	Section A.		Section B.	
	Silent.	Concerted.	Silent.	Concerted.
St. 6..... (36 pupils)	18.4 (2.3)[5]	15.7 (1.6)	18.7 (1.8)	14.9 (1.7)
St. 4..... (42 pupils)	12.1 (1.4)	10.8 (.8)	11.4 (1.2)	10.6 (1.3)

TABLE II.

Maximum Marks: 16.

	Section A (Silent.)	Section B (Concerted.)
St. 5..... (34 pupils)	15.4 (.9)[6]	13.2 (2.1)
St. 4..... (32 pupils)	10.5 (1.7)[6]	8.6 (1.1)
St. 3..... (36 pupils)	6.2 (1.8)	6.7 (1.2)
St. 2[7] ..... (40 pupils)	7.0 (1.4)	6.4 (1.7)

Results and Conclusions.

The tables show that in the majority of cases the silent method produced the better results. As there is in the psychological and educational worlds considerable distrust of *average* results,—and rightly so,—it is necessary to supplement them with further data. The papers sent in by the pupils who learnt by both methods were compared. Twenty-five out of the thirty-six in St. 6 (Table I) obtained higher marks when they had learnt silently; nine had better marks with concerted learning, whilst two had precisely the same marks for the two reproductions. Even allowing for the fact that the reproductions were of different stanzas, nevertheless, the majority in favor of silent learning is so great as to add considerable evidence to that of the averages. In St. 4 (Table I) twenty-six of the forty-two pupils obtained better marks after learning silently, fifteen after learning in concert, and one pupil obtained the same marks for both reproductions. In some of the classes, after the children had handed in the papers, the question as to which method they preferred was asked, and in each case where this was done there was a majority in favor of silent work.

It is not difficult to suggest explanations of this result. An important consideration is that there are considerable individual differences manifested in the process of learning poetry. There are differences in rate of learning, span of apprehension, difficulties in understanding the words and phrases, kinds of association, types of

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[5]The numbers in brackets indicate the mean variations.

[6]In these cases the average might have been higher had the poem been longer, because some of the pupils reproduced the whole poem correctly, and could probably have learnt more in the time given.

[7]In this class a list of 20 familiar words, *e. g., six, give*, were learnt by repeating the list three times, Section A doing it silently, and Section B simultaneously. One mark was given for each word correctly reproduced, and therefore the maximum mark in this case was 20.

imagery, and many other differences in the numerous factors involved in such a complex process as learning a poem. Concerted learning gives but little opportunity for these differences to operate, whereas in silent work much more scope is given them. Moreover, learning is not the mechanical process which teachers assume it to be. It implies considerable control of attention, and much depends upon a clear apprehension of the subject-matter; and this intellectual part of the work cannot be done effectively amidst the noise and with the fixed speed (making no allowance for individual differences) which concerted repetition involves. Another investigation conducted by one of the writers yielded data which indicated that pupils of the elementary schools complain a great deal about the noisy repetitions of the schoolroom. Pupils show marked preference for quiet lessons, *e. g.*, drawing, needlework, etc., in which, as one pupil puts it, he gets a chance to do things in his own way.

There is one feature of the results given in these tables which lends support to the view that silent work is the more effective because it allows individual differences to come into play. The feature referred to is that the silent learning shows to better advantage in the senior classes; in fact, in one of the lower classes the concerted work gives a better result. This is what might be expected if we bear in mind that the higher the stage of development the greater the diversity of individual differences. This aspect of our results might be interpreted by some as condoning to some extent the use of concerted methods in teaching lower classes. This is an instance of false reasoning, which seems to have been applied during recent years in interpreting many experimental results. The fact that individual differences have not manifested themselves is no reason why we should adopt methods of teaching which retard their appearance. The fact that the seed of the poppy resembles that of the mignonette is no reason for planting them in the same soil and under identical conditions. When we are told that the psychologist can discover but a few fundamental differences between boys and girls of ten, it by no means justifies the view that the same instruction can be given to both sexes without causing intellectual retardation.

Notwithstanding these considerations, our results give some evidence that concerted work does help a certain type of pupil. As already pointed out young pupils find it more helpful than older ones. It was also noted that the girls who gave the best results

with the concerted method (Table I) occupied, as a rule, a low position on the class list. Thus young and backward pupils seem to receive some help from concerted repetition. No doubt, this collective method gives confidence to the diffident pupil, as his failure relative to the rest of the class is somewhat masked; and probably there are other incidental advantages, *e. g.* a more marked rhythm. The advantage of introducing concerted work receives some support from data obtained by one of the writers in a series of experiments in which the amount learnt in six minutes of silent work was compared with that learnt in six minutes when two minutes were given to silent work, two minutes to the concerted method and the remaining minutes to the silent method again. Notwithstanding these advantages of the concerted method, our results urge upon us the conclusion that silent learning should be the predominant method, and concerted learning the exception which might be employed to advantage with young and backward pupils.

Before concluding, it will be well to draw attention to the number of lines memorized by the pupils in the short periods of six, eight and ten minutes. Many pupils learnt on an average two lines a minute, although it must be borne in mind that the lines were not long. The chief condition the teacher has to ensure in order that this remarkably efficient aspect[8] of the child-mind can manifest itself is that the child understands what it is given to memorize. The efficiency of the learning was tested in one of the classes (St. 5, Table I) by getting the pupils to reproduce the poem a week later without any previous warning that they would be requested to do so. The average for the silent work was 15.6 lines and 14.9 lines for the concerted work. These figures imply that many pupils were able to reproduce more after a week had elapsed than on the day they learnt the poem, a feature that has been noted by several experimenters in the past,[9] but which has recently been investigated elaborately by Mr. P. B. Ballard. The fact that the amount of "reminiscence" (not retentiveness) is greater with the concerted work supports Mr. Ballard's general conclusion that the power "to reminisce" is manifested to a greater extent by young and backward pupils.

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[8]Winch's experiments on The Transfer of Improvement in Memory showed incidentally how rapidly and efficiently children could learn poetry by an individual method.

[9]For English children this has been pointed out by Winch in his *Aussage* work, part of which was published in the *Proceedings of the First International Congress of Paidology*, 1911.

THE CONFERENCE ON MENTAL HYGIENE AT BOSTON.

A Mental Hygiene Conference was held in Boston, March 31 to April 4, inclusive, conducted by the National Committee for Mental Hygiene and the newly formed Massachusetts Society for Mental Hygiene. In connection with the conference was an exhibit similar to that given at the Congress of Hygiene and Demography in Washington and in New York and other cities (see the JOURNAL OF EDUCATIONAL PSYCHOLOGY, January, 1913.)

The conference began with addresses by Dr. Paton of Princeton on "Methods of Studying Human Activities," and by President-Emeritus Eliot of Harvard on "The Treatment of the Insane in Any Community," and at the closing session on Friday afternoon Dr. Putnam spoke on "Our Obligation to Understand the Working of Our Own Minds," and President G. Stanley Hall on "Mind and Food," with Dr. Sidgwick of the Massachusetts Institute of Technology presiding.

These addresses suggest the wide scope of the program. Among other speakers were Dr. Tuttle, superintendent of the MacLean Hospital; Dr. Southard, director of the Psychopathic Hospital in Boston; Dr. Fernald, superintendent of the School for the Feeble-minded at Waverley; Dr. Steadman of Brookline, Dr. Orton of the Worcester State Hospital, Dr. Neff, superintendent of the State Hospital at Foxboro, and Judge Baker of the Boston Juvenile Court.

It was noteworthy that, while most of what has been said and written recently on mental hygiene has concerned the pathological, considerable attention was given at this conference to normal mental processes. Dr. Cabot, for example, spoke upon "Four Laws for Mental Hygiene;" Dr. Burnham of Clark University on "Mental Hygiene in the School," and Professor Yerkes on "Hygiene and Mental Development."

The printed program was somewhat elaborate and contained many statements of facts in regard to insanity and the mental hygiene movement, and also gave concrete practical suggestions in brief form for the protection of mental health. The emphasis was placed on prevention and on the training of children. The slogan of the conference was as follows: *"The chief business of society is to evolve adults fit for children to live with."* Among the practical suggestions given were the following:

Train your child to thorough cleanliness both of mind and body. Bad companions as well as common towels, common drinking cups

and the like should be avoided, because there is danger of contagion both physical and mental.

Give your child a variety of well-cooked, wholesome food in ample quantity at regular intervals.

Train your child to healthful habits of sleep in fresh air, giving opportunity for at least nine hours, and for more than that before the age of 12.

Avoid conditions that tend to produce overstrain or precocity. The special business of a young child is to grow and to play with other children.

Give your child opportunity for a variety of wholesome activities and interests.

Train your child to work hard in some regular occupation suited to his ability and talents, but to avoid extreme fatigue by alternation of work and rest.

Train your child to give attention to the present situation and not to worry about the past or the future.

Train your child to strict obedience in a few important matters and let him alone in regard to other things.

Train your child to avoid drugs and stimulants of all kinds.

Protect your child from shocks. Do not frighten him yourself or let other people do so.

If your child becomes worried and sleepless, or has muscular twitchings or the like, consult a competent physician at once.

The best method of training is example; and what is good for your child is usually good for you.

Take advice of a competent person concerning the peculiar, sensitive or nervous child, in order to correct a possibly bad inheritance by proper education and environment.

Try to get a little recreation every day, and a vacation oftener than once a year.

Try to keep your weight up to that regarded as "standard" for your height.

Cultivate a cheerful, generous and charitable disposition.

There are many forms of insanity; a large percentage is preventable, and a considerable proportion curable.

Observe the few well-established and simple rules of health concerning food, sleep, exercise and recreation. Avoid alcohol, drugs, immoral living, venereal diseases, great mental or physical stress and excesses of all kinds.

Be temperate in all things.

WM. H. BURNHAM.
Clark University.

SOUTHERN SOCIETY FOR PHILOSOPHY AND PSYCHOLOGY.

The eighth annual meeting of the Southern Society for Philosophy and Psychology was held at the Johns Hopkins University, Baltimore, on April 8 and 9. Among the papers presented there were three that fell within the field of educational psychology, and so should be of interest to the readers of this JOURNAL. Abstracts of these papers follow:

A Psycho-Educational Study of the Fourth and Fifth School Grades, by Bird T. Baldwin, Swarthmore College.

For purposes of psycho-educational analysis it should be recognized that every child has five interrelated ages: a *chronological age* in years, months and days, denotive of the temporal span of life; a *mental* or *psychological age* denotive of the ripening of certain instincts, capacities and mental traits; a *physiological age* denotive of stages of physical maturity and growth; a *pedagogical age* denotive of the rate and position in school progress; and a *moral or religious age* denotive of fairly well-defined nodes of development in moral judgment and religious awakening. These ages may or may not correspond in their stages of development.

It is the aim of this paper, which is a very brief report of a section of a larger investigation, to inquire into the interrelations of the chronological age, the pedagogical age and the physiological age of normal children. The fundamental questions are: How do children progress through the elementary school? How do children grow and mature physiologically during their elementary school life? What is the relation between these two aspects of development when both are studied consecutively throughout the elementary school?

It must be recognized that since we are investigating the *pedagogical age* and since promotions are based on marks, these records must be taken at their face value, because they represent school practice and because they offer tangible criteria of the efficiency of the individuals and of the school. The progress through the elementary school of the twenty-five boys and the twenty-nine girls followed in this report is based on 10,579 final quarterly term marks.

Some of the main facts are: Girls maintain a higher school standing than boys; there are also more repeaters among the boys and fewer cases of "skipping" a grade. In the fourth and fifth grades the

boys and girls of the group are of approximately the same age, but in the last year of high school the boys are older on the average. Pupils who are relatively poor in the first few grades are relatively poor in the upper grades; that is, poor marks in the early school courses are indicative of low standing throughout the school course. Boys and girls of normal school age or younger maintain a better school standing both as to grades and marks than those over age for grade. The age of entrance after six or seven years determines the age for completing the work of the elementary school. With very few exceptions these children progress through the elementary school at the rate of one grade per year, regardless of the chronological age at entrance. A more careful study of individual marks shows that there are waves or nodes in the marks from year to year for each individual, the most prominent drops coming at the entrance to the high school and in the fourth and fifth grades. The subjects in which the boys do poorest work during the fourth grade are mathematics, penmanship, spelling and manual training; during the fifth grade penmanship, art, manual training, spelling, mathematics. The subjects in which the girls' marks drop back during the fourth grade are mathematics, geography, reading, penmanship and history; during the fifth grade mathematics, art, penmanship, geography and spelling.

A detailed study of the individual growth curves in height, weight and lung capacity, weight-height and vital indices, and periods of physiological changes, shows that the taller and heavier boys and girls, who are also the younger of the two groups of children, mature physiologically earlier than those below medium height. These physiologically accelerated boys and girls complete the work of each grade in the elementary school at an earlier age and with a higher average mark than the short, light or physiologically retarded boys and girls.

The growth curves show there is a correlation between the *decrease in annual increment in growth* in height, weight, lung capacity (and their corresponding indices) and the *lowering in general school averages in school standing during the ages included in the fourth and fifth grades for boys and girls.* What this means will be taken up in a later paper.

A New Test of General Intelligence, By L. R. Geissler, University of Georgia.

This test is intended to provide a continuous and graduated measure of acquired knowledge and native rationality of pupils whose

age ranges between 9 and 19 years. The material consists of two equally long lists of words chosen systematically from the various realms of human experience in such a way that every word on one list is related to a word on the other. One list is hung up before the pupils and a word of the second list is written on the blackboard with the instruction to find some word on the exposed list to which the single word is related, to write down the pair and to give the reason for pairing. Then another single word from the second list is written on the blackboard with the same instruction, and this procedure is continued until the second list is exhausted.

The general intelligence is assumed to express itself in the number of words correctly paired, the fitness of the pair, the number of correct reasons, their fitness, and in spelling, expression, etc. Each of these factors is marked separately, and their total is a measure of the individual's general intelligence. With the valuable aid of Misses Ruth Collins and E. A. Anderson the test has been applied to 62 girls of a preparatory school, whose ages range between 14 and 19 years. The results were correlated according to the Rank-Difference-Method, with those of a general information test devised by Miss Collins, giving a coefficient of .75, with the pupils' ages, giving .57, and with a strength of grip test, using the improved Smedley dynamometer, giving .176 as a correlation-coefficient. The test should be useful in comparing white and colored children and normal and abnormal minds. Its great advantage is the fact that it allows continuity through all grades and minute gradation of all degrees of intelligence within its limits.

A Comparative Study of White and Colored Children by the Binet Tests, By Josiah Morse, University of South Carolina.

This is a preliminary report of a study of the public school children of Columbia, S. C., by Miss Alice Strong. Goddard's 1911 revision of Binet's tests was used. The number of children tested to date is: white, 119; colored, 120. Of the whites 25.2 per cent. tested below age; 42.9 per cent. at age; 28.6 per cent. above age. Of the colored 60.8 per cent. below age; 30 per cent. at age; 9.2 per cent. above age.

The graph for the whites resembles closely that given by Goddard, but that for the colored is strikingly different. The range of individual difference is greater for the latter, but the excess is on the deficiency side. Of the 119 whites one was 3 years below age; seven 2 years below; twenty-two 1 year below; total, 30. Of the 120 colored

one was 5 years below age; one 4 years; eight 3 years; twenty-seven 2 years; thirty-six 1 year; total, 73.

The whites also had one 3 years above age; seven 2 years; twenty-six 1 year; total, 34.

The colored had none 3 years above; one 2 years; ten 1 year; total, 11.

The "near-white" showed the widest variation both above and below standard. Four were so irregular that it was difficult to determine whether to count them with the six-year group, or seven, or eight, or nine. They are therefore grouped as irregular.

From another table it appears that for the colored 60 per cent. of the tests are too difficult; 20 per cent. too easy; 20 per cent. right.

For the white 25.7 per cent. of the tests are too difficult; 25.7 per cent. too easy; 48 per cent. right.

Counting as satisfactory those who test at age, and one year either above or below gives 83 per cent. of whites and 68 per cent. of colored.

Another table yields the following results:

	White.	Colored.
In lower grade according to physical age.....	44.5%	44.2%
In lower grade according to mental age.....	46.2%	15.8%
In right grade according to physical age.....	53.9%	47.5%
In right grade according to mental age.....	42.9%	44.2%
In higher grade according to physical age.....	1.7%	8.3%
In higher grade according to mental age.....	10.9%	40 %

W. C. RUEDIGER, Secretary.

The George Washington University.

THE INSTITUTE FOR EXPERIMENTAL PEDAGOGY AND PSYCHOLOGY OF THE LEIPZIG LEHRERVEREIN.[1]

The Institute for Experimental Pedagogy and Psychology of the Leipzig *Lehrerverein* is a special organization existing within the *Verein*. It was founded in May, 1906, largely under the leadership of Rudolf Schulze, the author of the well-known book, *Aus der Werk-*

[1]A characteristic feature of the development of educational psychology and experimental pedagogy in Germany is the extensive participation in it of teachers both from elementary and secondary schools. These teachers not only take steps to keep themselves familiar with the progress of the movement, but also themselves make active contribution to it. This work is carried on, for the most part, in the various Teachers' Unions. Professor Kohl, who has recently returned to America after spending several months at Leipzig, has been asked by the editors of the JOURNAL to contribute this sketch of the work of one of the best known of these Teachers' Societies.—G. M. W.

statt der experimentellen Psychologie und Pädagogik. Neither the seminary nor the university gave adequate opportunity for work in experimental pedagogy, and it was the aim of the founders to supply this need. In their own words, "The Institute aims to introduce its members into experimental pedagogy and psychology, to give opportunity for independent scientific work in both fields, and to interest wider circles in both sciences." The Institute was begun by private subscriptions and is still so maintained. The membership has grown from forty-seven, in 1906, to nearly two hundred; and, while the greater part of these are teachers in Leipzig, yet there are enrolled teachers from other cities, directors and rectors of schools, students from the university, and men from foreign countries.

At present the institute occupies seven rooms in the *Lehrerverein-haus,* each one well fitted with needful appliances and work tables. While the apparatus is not elaborate, yet the supply is large enough to conduct a thorough introductory course in experimental pedagogy. Moreover, the special investigations conducted by members of the institute ordinarily add valuable materials to the equipment. The selection of books in the library is a most admirable one; and the large use made of these testifies to the deep interest that is taken in the subject.

The institute is thoroughly alive and has been so from the beginning. Dr. Max Brahn, Privatdozent in Leipzig University, is director, and Mr. Johann Handrick is assistant. Both these men give a large part of their time and interest to the institute and almost gratis. Each Monday evening of the school year is set apart for discussions; and here are presented papers on special investigations, reviews of articles and books, and criticisms of methods and apparatus. Outside investigators are often invited to present lectures on their work. The average attendance at these meetings is about twenty, though certain topics often call out a much larger number. These meetings remind one of a thoroughly up-to-date graduate seminar in our universities. A paper is read the first hour and then follows a lively and critical discussion for another hour. The topics are technical and the discussions are pointed and fearless. When the fact is taken into consideration that most of the members present are *Volkschule* teachers who teach six days of the week, we get an index of the interest that exists in experimental pedagogy in the institute.

One afternoon each week for two hours the assistant director conducts an introductory course in experimental pedagogy, where the methods and apparatus of the science are discussed and explained.

The course is virtually a laboratory course of a very high order, since first-hand work is done on school children who are brought to the institute by the teachers taking the course. The aim here is to develop interest and to open problems which members of the class may take up for serious independent investigation. When such a problem is taken up, the director and assistant act as guides and advisers till the work is completed.

In a little over six years the members of the institute have produced four good-sized volumes of publications: three have appeared and the fourth went to press last December. Some of these articles are quite widely quoted in German pedagogical literature. Lindner's investigation on the first language instruction for the deaf and dumb; Freeman's work on attention and number concept in children and adults; Jones' research on the limen for color saturation in children; Watkins' contribution on the relations between intelligence and learning and retention; Block's experiments on the use of the ergograph for measuring fatigue—these serve to show the character of the work done. The ideal of all the work is that of holding rigidly to the scientific method; intensive rather than extensive is the motto. In fact, the ideal is so rigidly adhered to that suggestions for more extensive work, such as those given in Stern's *Die differentielle Psychologie,* are looked upon with extreme skepticism by many of the active members of the institute. The most insistent problem now under discussion by these members is: Shall the institute break from those topics of psychology that admit mathematical treatment, such as sensation, fatigue and movement, and enter the fields where the *Aussage* and questionnaire methods have to be applied? So far the investigations have been essentially in the field of pure psychology on the Wundtian basis; however, the tendency is now to get closer to school problems, particularly to train teachers actually in service and to attack in a scientific manner the problems they face in the places and under the conditions in which they face them. Here is an idea worthy of our attention in this country. We cannot expect all the vital problems of experimental pedagogy to be settled in a university laboratory. Our school clinic idea ought to be widened into an institute for experimental pedagogy and then established in every school system of considerable size.

CLAYTON C. KOHL.

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WHEN SHOULD A CHILD BEGIN SCHOOL? A REPLY TO PROFESSOR STRAYER.[1]

It is usually best to let reviews alone. I speak from sympathy with reviewers as well as with authors, for I have been, I suppose, more reviewer than author myself. And reviewing, at least in England, is badly paid and thankless work. Yet I cannot quite accept Professor Strayer's account of my monograph on the Age of Entry into School. I am not going to complain that he has not emphasized the unique, laborious and protracted nature of the research; because every researcher, rightly or wrongly, is convinced, in his own heart, that his researches are unique, and if he has made them laborious,—well, so much the worse for him. But I *should* like to say that the method is experimental as well as 'statistical,' and that many other important and disputed questions are dealt with besides the intellectual advantage or disadvantage of early entry. Professor Strayer, with greater foresight than my own, *expected* the conclusion which the figures indicated. But in England we are still spending large sums of money every day in virtue of the contrary conviction. We, indeed, have a profound belief in early entry into school, which no evidence seems to shake. Driven from 'intellectual advantage,' its defense entrenches itself behind 'moral advantage,' and expelled from that redoubt once more makes a stand behind 'advantage in the development of the attention.' An attempt has been made to deal with these defenses too, as well as the 'intellectual advantage' to which alone the reviewer refers. I was not, be it understood, an external assailant; for I thought, when I began firing, that my projectiles would defend the forts. Still, that's only England! Yet I seem to remember that, even in America, the most progressive States educationally are those where the entrance age is lowest. So that the question may become very practical even there, some day. And, in any case, my method of measuring school progress weighted for age could not be used to test the value or otherwise of preliminary kindergarten teaching in the large cities of the States. I am sorry I appear to be reviewing my own book; but if the reviewer won't do it, what is a poor author to do? He may, of course, accept the reviewer's omissions as justified; but if he could do that he would probably never have undertaken such a laborious, and from a personal point of view, such a profitless task.

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[1]When Should a Child Begin School? By W. H. Winch. Educational Psychology Monographs. Warwick & York, Baltimore.

I did not for one moment suppose that anything 'the schools could do between the ages of three and five could offset differences due to heredity,' though strong environmentalists might think so. That was not my problem. My problem was to find out whether those earlier instructed succeeded better than those later instructed when these groups were of equal intellectual ability. Even in my moments of most exalted educational enthusiasm I have never believed that early school instruction was *more* important than natural ability. The next suggestion of my reviewer is the usual and ordinary suggestion of teachers who read parts of my monograph and omit to read others—it is really a mistake to cut a thing down and make it short as I have done; it lacks literary ease and encourages skipping. The suggestion runs: it all depends upon the system of instruction; *that* is the secret of the whole matter. And then a perfect babel of contrary voices tells us what we ought to do. "How can you expect children who enter school young to be further forward, if they don't begin to read and write any earlier than children who come later?" That's from one side. From another we have: "Of course, they are no further forward if they begin to read and write early! Have you forgotten Pestalozzi and Froebel? The children *must* pass their first school years in kindergarten work if proper progress is to be achieved later on." Well,—England has at present a very elastic educational system and by working in schools which presented very different educational attitudes towards the training of young children and by finding the same result in all of them, I hoped I had given some grounds for the belief that, so far as the ages I dealt with were concerned, the conclusions were independent of the form of teaching adopted. I know that my research has been welcomed by those who don't want any school for children at all before ten years of age or thereabouts. They may be right; but that is not the *conclusion* of the monograph. The *method* of the monograph may be appleid to test the question, if there is an educational system anywhere sufficiently elastic.

Nothing is so interesting to us as our own work, and I am running on and on. I must stop, and some day, perhaps, Professor Strayer will write a book which I—at a moment of pressure—shall read hurriedly; and then—a fitting punishment to me—some one will write and try to demonstrate that I know very little about it.

W. H. WINCH.

Dulwich, London, England.

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EDITORIALS.

STABILITY AND SCHOOL EFFICIENCY.

The most serious and depressing aspect of American education is the instability of the teaching force. When from one-fifth to one-third of the total teaching staff changes every year, it is difficult to see how any efficient solution of school problems is possible. Is there any hope for betterment? A generation ago the supervising force was in the same plight, but today many communities are placing a higher value upon their superintendents. They are making it worth while to remain in service, they are encouraging scientific studies of school conditions, and are rewarding faithful and intelligent performance of duties. A striking instance of this is seen in the recent action of the School Board of Kansas City, Mo. Superintendent J. M. Greenwood, one of the veterans of school administration in this country, and a careful and conservative student of school affairs, handed in his resignation on May 15 after thirty-nine years of service. The resignation was accepted, and Mr. Greenwood was then elected adviser to the board at his presnt salary of $4500, with the understanding that he be relieved of all routine work and devote half his time to the investigation of educational problems. May the day soon come when communities will sufficiently appreciate the value of good teaching to take a similar attitude toward the rank and file of their teachers.

J. C. B.

NOTES AND NEWS.

President Garfield of Williams College has laid before his board of trustees a unique plan for a summer graduate school for the study of the humanities. The plan proposes that scholars of international reputation be invited to deliver lectures in Williamstown from the middle of July to the first of September, that the lectures be widely advertised, and that invitations be issued to a selected list of possible hearers. The lecturers would be liberally compensated, and the lectures would be open to all who desired to attend them. No credits would be given, but all the work would be on a strictly graduate plane. In this way a great service could be rendered to higher education in America, and a plant valued at nearly $2,000,000 would no longer lie idle one-fifth of the time.

President Nichols of Dartmouth College, who has been advocating all over the country that colleges devote themselves more to efficiency in education, has induced his faculty to attack the problem practically by issuing a little book containing a complete study of the curriculum and a careful analysis of the material taught in each course. The object of the booklet is to start men right from the beginning of their course toward the work they have chosen, and to make their college work of the greatest possible service to them.

How slowly and with what great pains the world moves! At the same time that directors of physical training are exerting themselves to the utmost to introduce folk-dancing into the schools, the State Legislature of Iowa is considering a bill to prohibit dancing of any sort in the public schools or in societies whose members are pupils in the public schools. Is this an attack upon what are considered the evils of high school fraternities?

Prof. W. F. Book, who was called from the University of Montana last fall to the newly created chair of educational psychology at the University of Indiana, has accepted the position of deputy State superintendent to take charge of the vocational work provided for in the new law relating to vocational education in Indiana. Superintendent A. O. Neal of Kokomo has been appointed to fill the newly created position of high school inspector.

PUBLICATIONS RECEIVED.

(Notice in this section does not preclude a more extended review.)

ALFRED BINET AND TH. SIMON. *A Method of Measuring the Development of the Intelligence of Young Children.* Translated from the French by Clara Harrison Town, Ph.D. Second edition. Chicago, Ill.: Chicago Medical Book Co., 1913. Pp. 82, and 21 plates. $1.00.

It is significant of the interest in the Binet-Simon tests that the first edition of this translation of the directions for their application was exhausted in less than a year. The present edition is printed on a larger page and makes a much better appearance. As the authoritative and final form of the tests the monograph will doubtless continue to be in great demand.

LOUISE STEVENS BRYANT. *School Feeding.* Philadelphia: J. B. Lippincott, 1913. Pp. 345. $1.50 net.

This is a book of great importance for practical school administrators. It brings together in untechnical form widely scattered data on the history of the movement for looking after the physical condition of the child, and gives a detailed account of the various experiments that have been tried in this country. The extensive bibliography and the practical appendices constitute an important part of the work.

BIRD S. COLER. *Two and Two Make Four.* New York: Frank D. Beattys Company, 1912. Pp. xiii, 248.

A series of historical, sociological and philosophical papers clustered around an arraignment of the public schools on the charge of lack of righteousness. This is due to the godlessness of the schools, and the outcome is a eulogy of Catholicism as a teacher of morals.

STEPHEN SHELDON COLVIN AND WILLIAM CHANDLER BAGLEY. *Human Behavior: A First Book in Psychology for Teachers.* New York: The Macmillan Company, 1913. Pp. xvi, 336. $1.00 net.

For the teacher as perhaps for no other is it important to consider the facts of mental life from the standpoint of behavior. In this text an effort has been made to select topics closely related to the work of teaching, to treat these topics concretely with a wealth of illustration, and to simplify terminology without sacrificing accuracy. Emphasis is laid upon instinct and habit, feeling and emotion, memory and economical learning. The final chapter on behavior and the higher thought processes is a valuable discussion of this much neglected topic.

MINNA G. COWAN, M.A. *The Education of the Women of India.* New York: Fleming H. Revell, 1912. Pp. 256. $1.25.

A painstaking, unbiased account of the present status of women in India, with an analysis of the three forces, Government, Indian and Missionary, contributing to their education. A clear and illuminating account of the present situation in India.

GEORGE E. DAWSON, PH.D. *The Right of the Child to be Well-Born.* New York: Funk & Wagnalls, 1912. Pp. 144. 75 cents net.

Can the desire for worthy parenthood be inculcated, or is it an instinct which manifests itself in inverse ratio to intelligence? Judging from the conversation of educated men and women on the subject, we are still far from the attitude of serious thoughtfulness which the biological gravity of the situation demands. This little book makes a popular but earnest appeal to intelligent people for a serious consideration of the problem of bringing a sufficient number of the right kind of children into the world.

Exceptional Children in the Public Schools of New Orleans. (A Report of the Committee of the Public School Alliance). New Orleans: The Public School Alliance, 1913. Pp. 36.

The report consists of a brief account of recent movements and present activity in New Orleans and makes five groups of constructive suggestions. The work has consisted of the instruction of prospective teachers of exceptional children, studies of individual cases, and a general census of the exceptional children in the city. This last, which is reproduced as Appendix I, classifies all exceptional children as (1) feeble-minded, (2) backward, (3) gifted, (4) incorrigible and (5) physically, but not mentally defective. There are several subdivisions of four and five, and the sexes are listed separately. This census is confessedly preliminary. Its merit would seem to be chiefly that of calling attention to the problem and of culling out the *minimal* numbers of each type of exceptional children. Its chief defect is that it had to be prepared by the co-operation of teachers without expertness for the work.

PROF. DR. SIGMUND FREUD, LL.D. *The Interpretation of Dreams.* (Authorized translation of third edition, with introduction, by A. A. Brill, Ph.B., M.D.). New York: The Macmillan Company, 1913. Pp. xii, 510. $4.00 net.

To psychiatrists and psychologists the *Traumdeutung* is known as Freud's greatest work and probably also his most important, because in it he sets forth at length his method of psychoanalysis. To the general reader Freud is probably known as a promulgator of new

and startling theories of the origin and significance of dreams, wit, humor, the various neuroses and many forms of emotional disturbance that are related by him in some mysterious way to sex. To both classes of readers, the professional and the non-professional, the fact that this translation has been made should be of great significance, because the original presented great difficulties, even to ordinarily competent readers of German—a circumstance that makes all the more meritorious this excellent translation.

The reader will find further comments on Freud's position in this JOURNAL—1: p. 35, p. 497; 2: p. 465; 3: p. 241 and 340.

CLARENCE TRUMAN GRAY, A.M. *Variations in the Grades of High School Pupils.* Educational Psychology Monographs, No. 8. Baltimore: Warwick & York, 1913. Pp. 120. $1.25.

Professors Strayer, Dearborn and others have recently called attention to the value that would accrue to education from a scientific study of the data already available for the investigator in the form of school marks. In the present monograph Mr. Gray presents a careful study of high school marks from the point of view of their variability and the factors which underlie the variations. He concludes that if teachers would make a scientific study of marking systems and of the distribution of grades the variations in marks would be strikingly decreased.

LAWRENCE J. HENDERSON. *The Fitness of the Environment.* New York: The Macmillan Company, 1913. Pp. xv, 317. $1.50 net.

The sub-title of this interesting book is "An Inquiry into the Biological Significance of the Properties of Matter," and its author is assistant professor of biological chemistry in Harvard University. In many biological discussions so much emphasis is laid on the fitness of the organism to the environment that the fact is overlooked that fitness is a relationship involving the environment just as essentially as the organism. The most important factors in the fitness of the environment are water and carbonic acid.

WILLIAM JANDUS. *Social Wrongs and State Responsibilities.* Cleveland: Horace Carr, 1913. Pp. 143. $1.50.

A radical attack upon the present theory of property. "It should require no argument to prove that industrial equity is incompatible with the private ownership of economic fundamentals." "Public expediency demands the socialization of all natural monopolies."

M. F. *A Valiant Woman: A Contribution to the Educational Problem.* New York: Thomas Y. Crowell Company, 1912. Pp. xiii, 303. $1.00 net.

Under the form of a biography of a quiet, clear-sighted, warm-hearted teacher the author attacks and ridicules some of the foibles and weaknesses of our modern school practices. The style is graceful and trenchant, and there is evidence of wide reading of the educational classics, but the spirit of earnest scientific study of educational problems has passed so lightly over the pages as to leave not the slightest trace of its existence.

Elizabeth McCracken. *The American Child.* Boston: Houghton Mifflin Company, 1913. Pp. xxiv, 191. $1.25.

This freshly written, charming little book admits one to the life of the child as it actually exists in the better class American home. In these days of indiscriminate carping and fault-finding with children and education it is a satisfaction to come upon a book that cheerfully and optimistically portrays the good in our modern conditions. Every elementary school teacher should not only read this book herself, but should have a copy at hand to read extracts from it to those who find it difficult to lay aside their blue spectacles.

Ernest C. Moore. *How New York City Administers its Schools.* Yonkers, N. Y.: The World Book Co., 1913. Pp. xi, 321.

This is undoubtedly the most interesting volume on school administration that has appeared in many years. Professor Moore was the member of the Hanus Commission whose task it was to investigate the duties and functions of the Board of Education of New York City. Contrary to expectation, Professor Moore found and reported that the Board of Education had been illegally coerced and hampered in its work by other parts of the city government. The report was, therefore, not pleasing to the authorities, was "rejected," and is here published in book form. Would that it might be read by every member of a school board!

C. Lloyd Morgan. *Instinct and Experience.* New York: The Macmillan Company, 1912. Pp. xvii, 299. $1.50 net.

All recent studies in educational psychology indicate the importance of inherited tendencies in the educative processes. Textbooks in education are laying increased emphasis on instinct and its modifications. The present discussion of instinct and experience by that veteran student of behavior, Professor Morgan, will be welcomed by all educators and psychologists, especially since the author includes a critical examination of the views of Bergson, Driesch and McDougall.

FRIEDRICH MUELLER. *Aesthetisches und ausseraesthetisches Urteilen des Kindes bei der Betrachtung von Bildwerken.* Leipzig: Quelle und Meyer, 1912. Pp. 94. Mark 3.

An important experimental study of judgment in children and adults. The author advocates specific training in esthetic judgment, coupled with adequate instruction in drawing and in the synthetic description of pictures. The connection between rational judgment and class standing is not close.

SCOTT NEARING, PH.D. *Social Religion.* New York: The Macmillan Company, 1913. Pp. xvii, 227. $1.00 net.

"While misery remains in the land; while men are condemned to underpay and overwork; while women are forced into prostitution, and children are compelled to labor, there will be need for a Social Religion." A scathing arraignment of the attitude of church religion toward some of the burning questions of the day.

MAURICE PARMELEE, PH.D. *The Science of Human Behavior. Biological and Psychological Foundations.* New York: The Macmillan Company, 1913. Pp. xvii, 443. $2.00 net.

A better and more descriptive title for this book would be "The Evolution of Social Groups." It is dedicated to "three master investigators, Jacques Loeb, H. S. Jennings and Charles S. Sherrington," and gives a clear and well-knit account of the increasing complexity of behavior from the simplest organisms to man. Among the topics considered are reflex action and the functions of the nervous system, the relations of instinct and intelligence, conscious personality in its bearing upon social relations, insect societies, vertebrate societies, and the factors of social evolution in man.

L'ABBÉ C. PIAT. *La personne humaine.* Second edition, revised and enlarged. Paris: F. Alcan, 1913. Pp. xv, 404. Fr. 7.50.

In discussing the nature of human personality the author first considers the data of perception, those directly given in consciousness, and those gained indirectly through scientific investigation. Here the phenomena of successive and simultaneous dissociation are reviewed. In book two he treats of reflection and the different theories that have been offered in its explanation, and in book three he deals with the idea of responsibility.

HELEN C. PUTNAM, A.B., M.D. *School Janitors, Mothers and Health.* Easton, Pa.: American Academy of Medicine Press, 1913. Pp. 200. $1.00.

In the current discussions of school hygiene and sanitation too little attention is paid to the importance of carefully following up the work of the janitor. Perhaps the best and most effective way of

doing this is through the organized activity of the mothers' clubs. Dr. Putnam sets forth in direct, untechnical fashion what may be accomplished by this means for the health of school children.

J. M. Rice. *Scientific Management in Education.* New York: Hinds, Noble & Eldredge, 1913. Pp. xxi, 282.

Dr. Rice's claim to the title of pioneer in educational research in America is generally admitted, and his articles on the economy of time, on the futility of the spelling grind, and on measurement of results in arithmetic have been the starting point of many subsequent investigations. It is a service to the cause of education, therefore, to have these twelve papers collected and reprinted in book form, so that they may be more generally accessible.

J. Morris Slemons. *The Prospective Mother.* New York: D. Appleton & Co., 1912. Pp. xiii, 343.

In these days of practical eugenics and personal hygiene the period of infant gestation has not received the attention it deserves. The tales and admonitions that are handed down from one generation of women to another contain much of superstition and grotesque fancy. The intelligent woman of today is not satisfied with this, but wants to be told in simple, understandable language just what is taking place and what she can do to further the welfare of the unborn child. This demand is admirably met by the present book. Written by an associate professor of obstetrics at Johns Hopkins, it has all the authority of the medical profession behind it, yet the style is clear and untechnical and the discussion can be easily followed by any one of moderate intelligence.

Ellen Yale Stevens. *A Guide to the Montessori Method.* New York: Frederick A. Stokes Company, 1913. Pp. xii, 240. $1.00 net.

An interpretation of the Montessori Method for American mothers and teachers, with practical directions as to how to apply it, and a coherent explanation of its psychological basis. It is an interesting supplement to Montessori's book, and presents the views of a successful American teacher.

George Drayton Strayer and Edward L. Thorndike. *Educational Administration: Quantitative Studies.* New York: The Macmillan Company, 1913. Pp. xii, 391.

The present volume might almost be said to constitute a source-book in scientific studies of education, although the authors make no pretense at including work done outside Teachers' College. Yet it is more than a mere source-book, for the results of the studies are condensed, explained and related in such a way as to greatly facili-

tate the work of the student in familiarizing himself with the most important investigations in school administration. The material is arranged in five parts, including studies of the students, of the teaching staff, of the organization of schools and courses of study, the means of measuring educational products, and school finance.

HERBERT E. WALTER. *Genetics: An Introduction to the Study of Heredity.* New York: The Macmillan Company, 1913. Pp. 272. $1.50 net.

"An attempt has been made to summarize for the intelligent but uninitiated reader some of the more recent phases of the questions of heredity which are at present agitating the biological world. It is hoped that this summary will not only be of interest to the general reader, but that it will also be of service in college courses dealing with evolution and heredity." We have been very favorably impressed with this book from our preliminary inspection.

EDWARD J. WARD, Editor. *The Social Center.* New York: D. Appleton & Co., 1913. Pp. xi, 359. $1.50 net.

In view of the fact that some of the material in this book was written by others, Mr. Ward lays claim only to the modest title of editor, yet the volume is altogether the outcome of his thought and personal activity, and the other contributors would be the first to recognize his inspiration in their work. A very complete account of the wider uses of the school plant.

EDWARD E. WEAVER, PH.D. *Mind and Health.* New York: The Macmillan Company, 1913. Pp. xv, 500. $2.00 net.

This book is "an examination of some systems of Divine Healing," and contains an introduction by President G. Stanley Hall. Inasmuch as there is a strong tendency on the part of religious bodies to make non-medical healing a part of their work, and because this is done without a thorough knowledge of medicine or psychology, there is urgent need for the examination of this professed healing." Seven chapters are devoted to a discussion of psychotherapy and religious reality; these are followed by a consideration of Christian Science, the Emmanuel Movement, Doweyism, the Christian Alliance, and Metaphysical Healing.

WILHELM WUNDT. *An Introduction to Psychology.* Translated from the second German edition by Rudolf Pintner, M.A., Ph.D. New York: The Macmillan Company, 1912. Pp. xi, 198. 90 cents net.

This little volume is a popular introduction to the Wundtian psychology, and in its five chapters treats of consciousness and attention, the elements of consciousness, association, apperception and the laws of psychical life. It is not intended to take the place of the *Outlines of Psychology,* but merely to give a bird's-eye view of the field.